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A Quarterly for Research Related to War and Peace

Volume IV Number 1

THE GEOGRAPHY OF CONFLICT

Geography and the Social Sciences

Two Case Studies: Macrocosm and Microcosm

The Geographical Bases of National Power

The New Ecology of International Politics

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THE GEOGRAPHY OF CONFLICT

Issue Editors: GEORGE KISH
J. DAVID SINGER

The Geography of Conflict: Introduction — J. DAVID SINGER 1

PART I. GEOGRAPHY AND THE SOCIAL SCIENCES

Some Theoretical Notes on Geography and International Conflict — HOWARD E. KOCH, JR., ROBERT C. NORTH, AND DINA A. ZINNES 4

The Origins and Evolution of Geopolitics — LADIS K. D. KRISTOF 15

Political Geography in the Modern World — RICHARD HARTSHORNE 52

Climate and Society: A Review of the Literature — CHARLES KONIGSBERG 67

PART II. TWO CASE STUDIES: MACROCOSM AND MICROCOSM

Economic Conflicts in South Asia — RHOADS MURPHEY 83

Problems of Partition and Segregation in Northern Ireland — EMRYS JONES 96

PART III. THE GEOGRAPHICAL BASES OF NATIONAL POWER

American Dependence on Materials Imports: The World-wide Resource Base — JOHN M. DUNN 106

Some Bases of West German Military Policy — WALLACE C. MAGATHAN, JR. 123

A Tentative Evaluation of World Power — F. CLIFFORD GERMAN 138

PART IV. THE NEW ECOLOGY OF INTERNATIONAL POLITICS

Geography and International Politics in an Era of Revolutionary Change — HAROLD AND MARGARET SPROUT 145

Erratum 162

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The geography of conflict: introduction

J. DAVID SINGER

University of Michigan

In the three years since this *Journal* first appeared, conflict has been examined at a number of levels: intrapersonal, small-group, labor-management, interindustry, interracial, and international. And, with a few exceptions (7, 8), such conflict has been approached primarily from a behavioral[1] point of view, with the emphasis on personality, attitude and ideology, and communication. It is not that the social or institutional environment has been ignored; this aspect of the ecology of conflict has received more than adequate attention. But what *has* received relatively little attention has been the physical environment. The total result of such an emphasis might well be to convey an implication of individual or group autonomy—the notion that the only variables exercising any appreciable impact on the behavior of the actors are the internal characteristics, the external behavior, and the social setting of the individuals and groups involved.

Aware of the limitations of such an approach, and its incompleteness as a framework for the study of social conflict, the editors decided to devote a special issue to the role of geography[2] in the generation and resolution of intergroup conflict. The purpose here is to examine and emphasize those variables which are only partially, if at all, subject to human modification. Such environmental dimensions as climate, topography, land-sea configurations, and distribution of flora, fauna, and mineral resources impose considerable limitations on man's total autonomy. He may accept such limitations fatalistically, he may attempt to adapt to them, or he may seek to modify or rearrange these natural phenomena in order to broaden his range of alternative responses to the environment. But, in each case, the individual or the group is by no means completely the master of his destiny —there are certain "givens" to which man must adjust one way or another.

In an effort to illustrate the nature and significance of the environment as an independent variable in social conflict, we have sought a broader range of papers than one might ordinarily expect to find in a special issue devoted to some single topic. The four articles in Part I are all attempts to locate and identify the place of geographical considerations in the study of social conflict and the role of geography vis-à-vis the other disciplines involved in such research. The Koch, North, and Zinnes paper first offers a general model of goal conflict among na-

[1] The word "behavioral" is not used here in the restricted sense in which Duncan and Schnore (3) use it but rather in the broader sense, merely implying unconcern with physical and geographical variables.

[2] What we subsume under the rubric of "geography" is never altogether clear, but the papers by Kristof and Hartshorne should help dispel some of the ambiguity.

tions and concludes with a scheme by which geographical dimensions of such conflict might be systematically analyzed. The next two papers represent an effort to ascertain the relationship between politics and geography. The Kristof article provides us with a comprehensive analysis of the development of geopolitics (5), concluding with some pertinent observations as to its dangers and limitations. The Hartshorne contribution, in a somewhat similar vein, seeks to explore the place of political geography in the social sciences and offers us a broad survey of contemporary thinking on the state of the discipline. This section concludes with Konigsberg's summary and critique of the literature, classical and contemporary, on the role of climate in society.

The papers in Part II represent an effort to examine the man-milieu relationship[3] in two distinct geographical and social settings. Murphey's is macroscopic in approach, dealing with the entire range of economic problems facing the populations of South Asia. Here the focus is upon national aggregates, seeking rapid social change via technological innovation, and confronted with a stubborn array of formidable geographical limitations. On the other hand, Jones reports on a pair of limited populations in urban and rural Ireland; he examines the ways in which religious differentiation and attempts to formalize that differentiation via territorial redistribution have interacted to both generate and mediate Protestant-Catholic conflict.[4]

Then, in Part III, we have three papers which seek to relate certain geographical variables to international conflict. Here the emphasis is upon the physical components of national power and the fashion in which that power base, in turn, influences and limits the goals and strategies of the national state. In the paper by Dunn, we find a critical analysis of the policies by which the United States has sought to acquire the raw materials upon which that state's military power is heavily dependent.[5] The following study by Magathan illustrates the intricate fashion in which West German military organization is affected by such environmental factors as population age and skill distributions, technological levels, political divisions, and the strategic location of the state in contemporary international politics.[6] Next, German offers us a tentative and flexible formula by which national physical power may be continuously assessed, concluding with a contemporary ranking based on this formula.

The final part of this issue is, appropriately, devoted to the Sprouts' paper on the geographical aspects of international politics in today's rapidly changing world. In it, we are reminded of the tremendous significance of the phenomenology of political geography; the impact of environment may be great, but the way in which that environment ultimately affects international politics is primarily a result of the way in which statesmen and publics perceive, evaluate, and respond to the physical world.

The message, while not trumpeted, is clear. The man-milieu combination has

[3] This expressive phrase is borrowed from the title of one of the most valuable theoretical approaches to political geography yet published: Harold and Margaret Sprout's *Man-Milieu Relationship Hypotheses in the Context of International Politics* (9).

[4] This paper is reminiscent of Walter Firey's excellent study of thirteen years ago (4).

[5] As to whether or not there is even any relevance in the acquisition of such potential-oriented acquisition see Brodie (1) and Knorr (6).

[6] For a fascinating study of the historical background provided by German geopolitics see Andrew Gyorgy's World War II study (5).

made a shambles of those natural barriers which once offered safety to advantageously located states; the bulwarks of ocean, mountain, jungle, and desert have been vitiated by military technology, and, as in the past, the weaponry of defense has lagged behind the weaponry of attack. Today the lag is so great that strategies of defense have been corrupted into strategies of reprisal. No longer is the plan one of repulsing the aggressor but one of retaliating against him with a destructiveness even greater than that initiated. The changes which man has wrought in his environment and the implications of such modification strongly suggest that the territorial state as an instrument of physical security is as obsolete as the medieval castle. The crucial question is whether, having wrestled successfully with his environment, man will now demonstrate his ability to readapt his political institutions to the new geography in such a fashion as to make survival possible. The probability is low, but the peace-oriented social scientist cannot flinch from this formidable task. There is too much at stake.

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Some theoretical notes on geography and international conflict[1]

HOWARD E. KOCH, JR., ROBERT C. NORTH, AND DINA A. ZINNES
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Geography has long been considered a significant variable in international conflict. Scholars and statesmen alike commonly proceed on the assumption that the probability of war between two states is some function of their relative proximity, of the length and character of shared frontiers, of the existence or non-existence of natural boundaries, of the possession or lack of strategically located harbors, or of some other geographical combination. The testing of these assumptions has suffered, however, from the absence of a theory—or theoretical structure—of international conflict within which the geography variable could be analyzed systematically and with some degree of precision.

The first section of this paper attempts to construct a partial foundation for the theoretical structure of international conflict by defining certain basic concepts. Although there is no attempt here to build a model of international conflict, some concepts imply models and hypotheses. In such instances we have indicated how these models and hypotheses might be developed. In the second section the defined concepts are used to delineate in broad fashion the relationship between geography and international conflict—but without reference to the importance or unimportance of geographical elements as compared with other phenomena. Throughout the paper we have attempted to clarify each of the ideas presented by reference to historical examples.

[1] These theoretical notes have emerged from work papers produced by the Conflict Study Project, Stanford University.

Concepts Basic to a Study of Conflict

For the purposes of this paper the state is assumed to be the primary transactor in all international conflict situations. A state's *policy* will mean both its goals (or aims) and the methods by which the state reaches, or proposes to reach, these goals. The goals of a state do not refer exclusively to ultimate objectives but to any (and all) concrete goals which can be pursued or attained at any time in the future. Thus a state can be seen to have an infinite number of goals in the sense that its aims can and do change over time. Furthermore, at any particular time a state will have goals at varying "time levels"—tomorrow, next year, or ten years hence.

If a state's goals are thus defined, it is easily seen that the methods adopted to achieve them are also goals that must be attained as prerequisites to the attainment of the more distant objectives. Since methods can be so defined, it is not necessary to consider them apart from goals. *A set of goals* is defined as a progression such that acquisition of any one in the sequence depends on the attainment of all those preceding. Let us suppose, for example, that the Soviet Union aims for the establishment of "Bolshevik socialism" in a given Middle Eastern state at some point in the future. The first step toward attaining this objective might consist of a tactical alliance with "bourgeois nationalists" in the stat under consideration. Once this goal (method) has been achieved, local Communists might be expected to use the alliance in order to

achieve their own control of the state apparatus. The next goal (method) might be an agrarian program which, in turn, would be calculated to provide a basis for industrialization, itself a goal (method) for the achievement of "socialism" after the Communist model.

A state, then, can entertain simultaneously a vast number of goal sets. Many of these, moreover, will be found to overlap; in some instances the same goal will be found in several goal progressions. For example, the achievement of Communist control in a given country of the Middle East could serve as a goal (method) not only for the establishment of "Bolshevik socialism" there but also for the strengthening of Soviet Russia's frontier security.

If all the sets of goals for a particular state at a given time could be determined, then these (overlapping) sets would define that state's complete horizon of goals at that time. These sets of goals will change with time so that all goal sets of a state at one particular moment may differ from all those pertaining to another moment.

A *policy condition*, designated by "c_i," is a goal with a time specification implied or explicit: State A intends to acquire a given island within the week or five years hence. State B contemplates the acquisition, within a year, of a certain coaling station. Two or more states will then be said to have *incompatible goals* if their respective policy conditions cannot obtain simultaneously. In any particular problem there may be a large number of incompatible policy conditions, that is, ten states may have ten different policy conditions no two of which can obtain simultaneously. By way of illustration, if, as in 1912, Bulgaria desired the ultimate incorporation of virtually the whole of Macedonia into its territory (denoted by $A \rightarrow c_1$), while Serbia and Greece wished to acquire portions of Macedonia ($B \rightarrow c_2$ and $C \rightarrow c_3$, respectively), there are then three incompatible policy conditions, namely, c_1, c_2, and c_3, since all three powers cannot simultaneously own the territory (see Fig. 1). It should be noted that not every state will have a different policy condition with respect to a particular problem. A and B might agree that A should acquire island x, an island currently owned by C, so that $A \rightarrow c_1$ and $B \rightarrow c_1$, but $C \rightarrow c_2$.

Beyond the listing of incompatible policy conditions with respect to a certain problem, it should be possible also to list the number of incompatibilities between any two (or more) states, that is, the number of problem areas or disputes between them. Each dispute can be labeled with a superscript (c^j) to denote which problem is being considered. For example, the ongoing Arab-Israeli conflict may be described in terms (here greatly oversimplified) of a series of incompatibilities between them—the very status of former mandatory Palestine (c^1), the allocation of water resources (c^2), the rights of passage in the Suez Canal and Aqaba (c^3), and the repatriation of the refugees (c^4)—designated: $A \rightarrow c_1^1$, c_1^2, c_1^3, c_1^4 and $B \rightarrow c_2^1$, c_2^2, c_2^3, c_2^4, so that Israel (A) and any one of the interested Arab states (B) have four incompatibilities between them.

Whenever two (or more) states have incompatible policy conditions they are said to be in *conflict*. A *conflict situation* refers to all the c_i's for a particular j; for example, c_1^1, c_2^1, c_3^1, c_4^1, c_5^1. . . .

From this definition of a conflict it follows that in any conflict situation there will be a minimum of two parties. A *party* to a conflict situation can be defined as a c_i, that is, each i is a party to the conflict. In the conflict situation $A \rightarrow c_1^1$, $B \rightarrow c_2^1$ and $C \rightarrow c_3^1$ there are three parties. However, if $A \rightarrow c_1^1$, $B \rightarrow c_2^1$, and $C \rightarrow c_1^1$, then there are only two parties.

Each state involved in a given conflict is known as a *participant*.

The *scope* of a conflict denotes its size or magnitude and can be measured in a number of different ways: according to the number of parties, the number of participants, the gross national products of the participants, the population of the participants, the number of common frontiers between the parties, military budgets, men under arms, the number of casualties, etc. The degree of *severity* of a conflict indicates the probability that the conflict situation will result in *violence*, which

occurs when one or more casualties has been perpetrated by one party against another.[2]

By means of the above-mentioned scales (number of participants, gross national product, etc.), an increase or change in a conflict situation can be analyzed. For example, one might compare two types of conflict situation: those which involve violence and those in which no violence has occurred. By using a number of randomly chosen cases for each type, the scopes of the two kinds of conflict could be analyzed in terms of the increase in the number of participants. Let us assume that in both types of conflict there are only two parties. The increase in participants for one party may then be graphed against the increase in participants for the other party. Thus, Party I may begin with three participants, while Party II consists of only one participant, but, when a fourth participant joins Party I, Party II then acquires two participants. The graph might look something like Figure 2.

By comparing the two types of conflict, it should be possible to discern whether there are marked differences between violent and non-violent kinds. It may be that conflicts become violent only when there is an equal, or almost equal, number of participants in each party, that is, when the increase in scope lies along the diagonal.

A variation in this analysis would substitute population or gross national product for the number of participants. Thus the entrance

FIG. 1.—The Balkans, 1912—a multiplicity of incompatible multistate policy conditions. (Adapted from J. A. R. Marriott, *The Eastern Question* [Oxford: Clarendon Press, 1956], p. 439.)

[2] Compare this use of the casualty concept with that of Richardson in Rapoport (1).

of each new participant into the conflict would not be given equal weight as the model below assumes. Instead, the significance of the new participant would be measured in terms of gross national product or population size—with each increment added to the original GNP, population, or other figure (Fig. 3).

Again, one might hypothesize that violent conflicts will produce graphs having a function approximating $x = y$.

Against these scales the 1914 conflict would probably reveal a steep series of steps from limited to almost universal scope and a single,

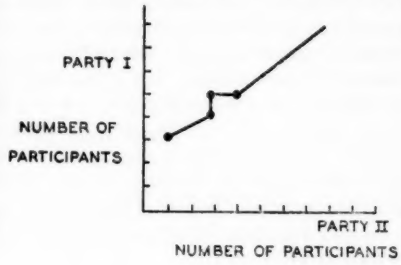

FIG. 2

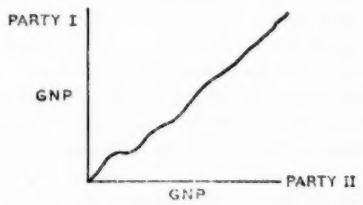

FIG. 3

almost vertical climb from low to extremely high magnitudes of violent interchange. The Quemoy crisis, subjected to the same kind of analysis, would present considerably different profiles.

Further along, we shall consider how such measurements can be correlated with policy conditions, alternatives of action, and other elements to clarify a conflict situation.

Theoretically, one can list all policy conditions for all states at a given time. By looking at all possible combinations of the policy conditions, it should be possible to group those which are mutually incompatible (those which cannot obtain simultaneously); each group would then correspond to a c^j and could arbitrarily be labeled $c^1, c^2, c^3, c^4, \ldots$. Each policy condition within group j would then correspond to a c_i and would be labeled c_1, c_2, c_3, etc. If, in the course of this herculean task, the j groups were labeled consecutively, one would discover the number of conflicts which existed in the world at that time. Although this would be of some interest, one is more concerned in a study of international conflict with the severity or significance of conflicts—with the conflicts which are likely to threaten international peace.

Let us assume that states attach different degrees of importance to their policy conditions so that for a given state a hierarchy of policy conditions could be constructed on the basis of their importance to that state. If such a hierarchy, or ordering, were constructed for each of the n states, each c^j could be plotted in an n-dimensional space.

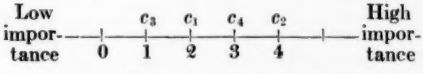

FIG. 4.—Order of importance to State A

The coordinates of each c^j in this space would indicate the degree of importance of that set of incompatible policy conditions for each of the n states concerned (Fig. 4).

For illustrative purposes let us assume for the moment that there are only two states in the world and consider the following incompatibilities: $A \rightarrow c_1^1$, $B \rightarrow c_2^1$, $A \rightarrow c_1^2$, $B \rightarrow c_2^2$, where c_1^1 is the third least important to State A; c_2^1 is fifth for B; c_1^2 is fourth for A; and c_2^2 is second for B . . . (Fig. 5).

It is now possible to say that all c^j's which lie above a certain line have serious implications for world peace. In other words, in conflicts where the incompatible policy conditions are highly important, the probability of violence is high. With this type of model one could begin to test hypotheses about the importance of certain conflicts for international peace. One obvious hypothesis would state, for example, that the probability of violence in any international conflict is a (certain)

function of the degree of importance of the incompatible policy condition for each of the concerned parties. In this example one might assert that the dotted line represents this function: all c^j's that lie above the line will involve violence. Or, stating the same hypothesis somewhat differently, one might simply state that as the c^j moves away from the point of origin the probability of violence increases (Fig. 6).

Two types of conflict can be distinguished: latent and overt. In a *latent* situation no party

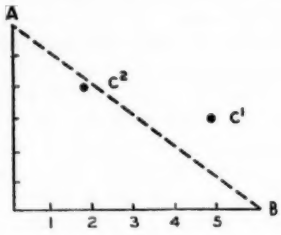

FIG. 5

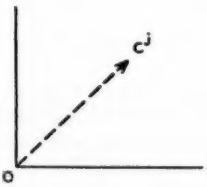

FIG. 6

is attempting to change the conflict. This circumstance may be due to a lack of perception of the conflict, disinterest in the conflict, mutual agreement to keep the conflict latent, fear that attempts to resolve the conflict will further damage relationships, or any combination of these factors. For example, the conflict situation $A \rightarrow c^j_1$, $B \rightarrow c^j_2$, $C \rightarrow c^j_3$ may emerge from the fact that State A is unaware of the conflict with B and C, B is uninterested, and C does not want to change the status quo.

Overt conflicts, by contrast, are those in which one (or more) party is attempting to change the situation. The probability that any party or participant in a conflict will attempt to change the conflict will be a function of the importance of the incompatible policy condition for that party (or participant) and the ability of the party (or participant) to achieve the policy condition. The party's ability, in turn, will depend upon its capabilities (credits and assets) and its incapabilities (liabilities) in relation to the capabilities and incapabilities of the other party. Overt conflicts can be either violent or non-violent.

It should be noted that violence (one or more casualties in a conflict situation) can occur intentionally or accidentally and can be sanctioned or not sanctioned by the acting state. If State A blockades State B as a non-violent method of forcing B to meet A's demands, and a member of State B dies of starvation, then violence has still occurred. To take a more extreme example, if A and B are in conflict and a member of State B happens to be walking across a street in State A and is killed by a car, violence—by our definition—has occurred. Violence is thus a function of casualties produced by one party to a conflict on another party.

Similarly, violence may or may not be sanctioned by the whole populace, or the majority of the populace, or the government. It may be argued, for example, that the assassination of the Archduke Ferdinand in 1914 was not sanctioned by all of Serbia. Since Serbia and Austria were in conflict, however, the assassination is considered a casualty and a violent act.

We distinguish three types of casualties: intended, perceived, and actual. An intended casualty is one which the acting state has perpetrated or consciously expects to perpetrate. A perceived casualty is one which the recipient state believes the acting state has perpetrated. An actual casualty is one which the research confirms as having been perpetrated. Unless otherwise specified, only the actual casualty will be considered.

In any overt conflict each participant state can choose among four types of alternatives. A state may (1) make a non-violent bid; (2) commit a non-violent act; (3) make a bid which carries an implication of violence; or (4) commit a violent act. This list does not represent any sort of hierarchy implying the

best or the least acceptable alternatives; they could be listed in any order. Within this scheme the choice of a "not to act" alternative is a commission of either a violent or a non-violent nature, depending on the consequences of this type of "action."

A *bid* is a threat or a promise (oral, written, or symbolic) of an intent, genuine or feigned, to commit or not to commit a certain act.[3] A bid of violence implies casualty taking.

A commission is the completion of an act and is considered violent if it results in one or more casualties.

When a participant state chooses one of these four types of alternatives, it is making a *transaction* between itself and the state (or states) toward which the bid or commission has been made.

If the four categories of alternatives are considered to be inclusive, it follows that an overt conflict, as heretofore defined, must necessarily involve transactions. In other words, given an overt conflict situation, at least one state must have chosen one of the four types of alternatives: it must have made either a violent or a non-violent bid or commission.

Using some of the measurement scales suggested earlier (number of participants, population, common boundaries, gross national products), one could analyze the change in the choices of alternatives and again compare violent and non-violent conflicts. If we use the number of participants, for example, and certain arbitrary but well-defined time cutting points, it would be possible to see the change in the number of participants who, let us say, make non-violent bids, violent bids, non-violent commissions, and violent commissions. In the first time interval one might find ten participants making non-violent bids, two making violent bids, one making a non-violent commission, and none making a violent commission. But, as we move into a later time period, the number of participants making violent bids may radically increase, and at some point we may find one or more commissions of violence (Fig. 7).

Time cutting points in a conflict (arbitrarily selected)

Alternatives:	1	2	3	4	5	6
Bid of non-violence	10	8	5	2	1	0
Commission of non-violence	1	3	3	2	0	0
Bid of violence	2	3	3	6	10	10
Commission of violence	0	0	3	4	5	10

Fig. 7

Note.—Numbers in cells denote number of participants who chose that alternative at that time. (Assume that the number of participants is constant for the entire conflict.) A state can choose more than one alternative.

Such an analysis would suggest whether violent conflict can be distinguished from non-violent conflict in terms of changes in choices of alternatives. It may be that violent conflicts will present identifiable patterns in the shifts of transaction choices.

Another approach to the study of transactions might involve a comparison of violent and non-violent conflicts on the basis of the number of violent (or non-violent) bids. One might find, for example, that the number of violent bids is considerably higher for conflicts that eventuate in violence. Graphing the two types of conflict in terms of cumulative frequencies, then, violent conflicts should reveal a significantly steeper incline (Fig. 8). Once again, the 1914 conflict and the Quemoy crisis suggest possibilities for this kind of analysis.

[3] Contrast this concept with the somewhat different definition used by Schelling (2).

During the last six weeks before the outbreak of World War I, the assassination of the Archduke Ferdinand led to an ultimatum dispatched to one party, Serbia, by the other party, Austria-Hungary. This bid of violence provoked Russian partial and then general mobilization, which, in turn, triggered Germany's Schlieffen Plan and the eventual involvement of the major powers—and many lesser ones—as participants in what was virtually a world conflict.

The Quemoy crisis, by contrast, never involved more than four participants. Two of these—Nationalist China and Communist China—exchanged commissions of violence over a considerable period of time. The other two—the United States and the Soviet Union—exchanged bids of non-violence, commissions of non-violence, and bids of violence—but stopped short of commissions of violence. The scope of overt violence, in short, remained strictly limited. So, too, the magnitudes of violent interchange—in terms of resource expenditures and of casualties—rose sharply, stabilized, and then, after about two months of crisis, dropped steeply off.

How are we to account for the great difference in pattern? Why did the conflicting policy condition in 1914 lead to a global war, while the Quemoy crisis ended in a cease-fire?

Only the completion of an empirical analysis would provide a basis for significant conclusions, but we can postulate at least this much: As we relate a choice of alternatives—such as those faced by Communist China in mid-October 1958—to policy conditions, instruments, evaluations, and resources, it will become clear that a transactor state, in coming to a decision, will tend to assess the importance of its goal in terms of (*a*) its own national capabilities; (*b*) the capabilities of the enemy; (*c*) the probable cost to itself; and (*d*) its ability to inflict cost upon the enemy. At the point where the cost is clearly perceived as too high, the crisis—unless irrevocable decisions have been made, as with the invoking of the Schlieffen Plan in 1914—is quite likely to be reduced.

Geographical Variables

With these concepts of international conflict, we are now in a position to consider the geographical variable.

Geography can mean the science (or study) of the natural features of the earth generally, or it can refer to these features specifically.

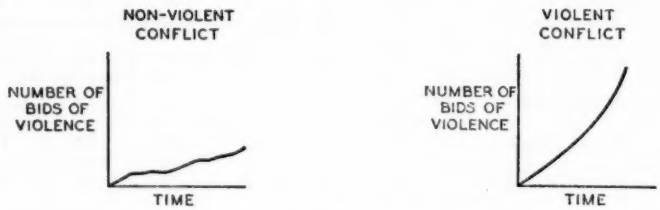

Fig. 8

Our concern is with the latter, and especially with the manner in which physical or geographical features of the earth influence conflicts.

For these purposes a geographical element will be defined as (1) any physical entity which (2) has some value (positive or negative) for a state. Such geographical elements may be designated as *resources*. Physical entities include such phenomena as mountains, water, ores, men, animals, and objects transformed by man. These entities may have positive value if they provide natural defenses, strategic materials, food for the populace, manpower, etc.—or negative value if they constitute indefensible positions, if they are critically deficient in strategic materials, or food, or manpower, or if they are viewed as otherwise inadequate or detrimental by the state which

controls them or by another state which has reason for assessing them.

The value (positive or negative) of a resource is determined in the following manner. At a given time a state (theoretically) takes inventory of all those things which it would like to acquire (these are its sets of policy conditions) and rank-orders this list in terms of the amount it is willing to pay for each policy condition. The state then determines, for each of these policy conditions, what resources it controls and what resources it does not control which will help it achieve the policy condition. These are its *credits*. The state also determines which resources it controls or does not control which might be detrimental to the achievement of the policy condition under consideration. These resources are called *liabilities*.

The discussion so far indicates that both possession and non-possession of a resource can have either positive or negative value. Similarly, the same resource—at the same time—may have greater value in one policy condition than in another. The same resource, indeed, may have a positive value for one policy condition and a negative value for a different policy condition—for the same state at the same time. For example, the possession of an international waterway may have positive value in that it brings revenue to the state through whose territory it passes, but it may also have a negative value if it invites interventions on the part of a third state with well-defined and long-established interests in the waterway in question. Non-possession of uranium ore could render a state's position insignificant in world affairs; but it could—through reduction of that state's war-making potential—have a positive value if the state preferred to avoid overt conflict by forcing the state to be neutral. Here Switzerland's geographical liabilities have proved, in the past, to be among its greatest assets.

The value of a resource can also change with time and circumstance. The British Channel, which served as a valuable defense barrier during the First and Second World Wars, might be of no significance whatsoever in the event of a third world war. The value attached to a resource will, of course, also differ from one state to another. The existence of a high-volume river in a territory lightly populated and covered with rain forest may provide no benefits beyond simple transportation; the same river placed in an area graced with both population and resources could provide a foundation for a powerful industrial civilization.

There are four aspects of resources which are significant for the study of conflict.

First, there is the *form* in which the resources are to be found—mountains, natural harbors, arid or cultivable lands, and many others.

Second, there is the *arrangement* of the various resources with respect to each other—the configuration of mountains, plains, and natural harbors; the proximity of iron and coal; and other critical relationships. It should be noted that we are not specifying the agent of the organization of resources: this could be the wind, rain, earthquake, or man. In these terms a canal or dam represents a certain organization of resources, as does a natural waterway.

Third, there are *boundaries* of the natural resources. Boundaries refer to the allocation of resources—the ways in which resources are divided among groups of people. These allocations can be the result of political frontiers, trade agreements, armed invasion, political spheres of influence, and other factors. Boundaries will expand or contract as resources change hands through conquest, trade, exploration, etc. In many parts of the world today, but especially in parts of Asia and the Middle East, we see, for example, a continuous pressure and counterpressure between the fluctuating economic, political, and ideological boundaries of the United States and the Soviet Union.

Boundaries can bring about conflicts in two different ways: (1) there can be conflicts over the allocation of resources and (2) there can also be disputes over the principles of allocation. Mankind, over the ages, has developed various systems for the allocation of resources—feudalism, capitalism, colonialism, imperialism, communism, and, in Soviet bloc countries, the satellite relationship. To a large degree the bipolarized conflict of the mid-

twentieth century is a struggle between two major allocation systems.

Fourth, there are the *values* which a state attaches both to resources and to their allocation. To what extent does a state consider a given resource—a tract of land, a river, a harbor, a mountain range, a mineral—useful, and how does the state compare that value to the value of other resources with which it is concerned? Does the state consider these resource allocations satisfactory or unsatisfactory, beneficial to its interests or injurious? According to what general system does the state allocate its resources, and to what degree does this system conform to the beliefs and practices of neighboring states or to influential powers?

If, having made these distinctions, we relate resources to our basic concepts of conflict, we find that the organization of national resources, their boundaries or allocations, and the values attached to both may each be fitted into a conflict situation in several ways.

In terms of the Quemoy crisis of 1958, for example, we find that the island and its environs (forms of resources and relation of resources to each other) were *aspects of policy conditions* for both Communist and Nationalist China in that each wanted control. Obviously, the boundaries or allocations of these same resources could also be considered as important aspects of Communist and Nationalist policy conditions, and, obviously, too, the extension of the Communist allocation system was a further aspect of the Communist policy condition. Beyond this, it was some value of the island and its environs which determined that these particular resources should become aspects of policy conditions put forward by both parties, and it was some value—positive to the Communists and negative to the Nationalists—which made the Communist allocation system an issue.

The fact that Quemoy was an island in a particular place with special value to both parties undoubtedly influenced *choices of alternative*. It influenced the Communists toward using physical force in the first place, it influenced the Nationalists toward retaliating with physical force thereafter, and later, perhaps, it had something to do with the Communist decision to call a cease-fire. Wholly different forms and relations of resources—the "underdeveloped" nature of the Chinese economy, the resource capacity of Communist China generally, the capabilities of Nationalist China, and the resources of the United States and the Soviet Union in the background—also influenced choices of alternatives on both sides. Again, too, the allocations and the values attached to resources, to allocations, and to systems of allocation all had something to do with choices of alternatives.

Finally, resources in the form of weapons systems and military ordnance and equipment served as *instruments* for effecting the physical violence. We can argue, too, that the Chinese Red Army artillery units and the Chinese Communist system of military allocation of resources—like Nationalist military units and allocation systems and, indeed, the United States Seventh Fleet—were also instruments for carrying out bids and commissions of violence.

Up to this point we have described the ways in which the organization of resources, their boundaries and allocations, and the values attached to both can be fitted into a crisis, but we have not suggested how their functioning can interact—affectively—with the functioning of other elements of a crisis situation.

The state of the Chinese economy, for example, and the location of the offshore islands (form of the resources and their relation to each other) influenced not only the choice of alternative, as we have already suggested, but also the choice of weapons, the nature and extent of weapons expenditure, and many other aspects of the conflict. Recollections of decades of Chinese frustration under Western imperialism (stored negative evaluation of resource allocation and of the allocation system) influenced the choice of a violent alternative and many other aspects. The magnitude and duration of the artillery bombardment were affected by the significance of the islands, in terms of these various interactions, to the People's Republic of China, by the

estimated cost to China of further action and its probable consequences, and by many other factors in the crisis.

To pinpoint as many of these interactions as possible, we can order the various elements of special interest to us within the highly oversimplified matrix of Table 1.

By reordering in this way the various elements under consideration, we make it possible to relate each of them to all of the others in a systematic fashion. The matrix could be extended, of course, to include other elements or to show Communist China in interaction with Nationalist China in terms of these, or other, phenomena. For any choice of alternative—the Austro-Hungarian ultimatum to Serbia in the 1914 crisis, for example, or the Russian mobilization, or the German invoking of the Schlieffen Plan, the Chinese Communist decision to shell Quemoy, or the cease-fire later on—we can measure the crisis against scales such as those mentioned above,

TABLE 1

	Geographical elements Form of resources	Relation of a particular resource to other resources	Boundaries (allocations for human beings)	*Human evaluations* Perceptions of positive or negative value, benefit or injury, gain or loss	*Goals—means* Policy condition	Choice of alternative	Instrument
Geographical elements Form of resources							
Relation of a particular resource to other resources							
Boundaries (allocations for human beings)							
Human evaluations Perceptions of positive or negative value, benefit or injury, gain or loss							
Goals—means Policy condition							
Choice of alternative							
Instrument							

and we can also identify the interactions of various elements with the alternative selected. Or, in an ongoing crisis, we can pinpoint the main phenomena which will influence the future choice of alternatives. A thoroughgoing matrix, of course, would include important elements which have been omitted because of space limitations and the geographical emphasis of this particular discussion.

The matrix in Table 1, then, indicates the possible interactions between geographical elements and certain other aspects of a conflict, but it does not postulate relationships. We have not discussed how the various geographical phenomena will influence the stages of a conflict or what their relative importance is likely to be in comparison with other elements. It is obvious that there are many hypotheses possible for the interactions revealed by each matrix cell. The next step for this study is the development of such hypotheses, an undertaking which does not fit within the scope of this paper but which we shall deal with in due course.

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The origins and evolution of geopolitics[1]

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Human Nature and Natural Environment

It is characteristic of our age that man's contact with his natural environment[2] is rapidly diminishing. Our living quarters, working places, and means of transportation are centrally heated and air-conditioned. It is only on rare occasions that our foot (or shoe) touches mother earth, and, whenever the outdoor temperature seems to us at variance with the optimum of our preferences, we are able not only to cover 90 per cent of our bodies with warming or cooling clothes but to reduce our contact with the natural elements to the few minutes it takes to get into and out of the car. Even such occupations as farming or logging, which supposedly force men to lead an outdoor life, do not in fact require more than 40 to 60 (out of 168) hours a week to be spent in the fields and woods. True, there are still countries where at least part of the population—the herdsmen and the hunters—spend a few months every year under the skies, but this way of life is rapidly disappearing even in backward areas of the contemporary world.

There was, however, a time when man was at the mercy of nature—when nature ruled over his habits of work and play, over what and how much he ate, and over where and how long he lived. The elements were, like an absolute ruler, striking terror or bringing relief, and man had neither the means nor the temerity to challenge them; he was always awed and ready to pay tribute of gratitude or propitiation. It was a time when nature imprinted on the human mind, from the cradle to the grave, a variety of images, the intensity of which could

[1] I wish to express my gratitude to all those who have, personally or anonymously, contributed professional advice and criticism during the preparation of this study, to my wife who painstakingly rewrote innumerable passages into intelligible English, and to Mrs. Helen Forsythe, who volunteered the arduous task of typing and retyping both the text and the multilingual footnotes.

[2] Some geographers will, perhaps, object to the term "natural environment" as used in this paper. Indeed, what is called "natural environment" is often cultural environment (cultural landscape). But, again, cultural landscape is all too often a misnomer, too; it frequently has nothing to do with culture. Culture implies something cultivated (more or less), that is, the result of a known, and presumably desired, causal relationship. Yet many of the changes caused by man in the natural environment—and among them probably almost all of those most enduring—are an incidental, unknown at the time, or even unwanted result of man's activity. Then we should remember that nature always tries to "heal" its man-made "wounds," and it is debatable whether this "second-growth" nature—this new skin which covers old scars—is less natural than the primordial one was. For a critique of the concept of "natural environment" see Hartshorne (41, pp. 65-71).

not be matched even by those induced by the most thorough totalitarian indoctrination. It was a time when man was *nature directed.*

Modern man has not, so far, escaped the grip of his environment, but nature no longer frightens him; he molds nature and hopes to change, even to conquer, it. Only on rare occasions can an earthquake, typhoon, or tornado strike terror and imprint in man's memory an unextinguishable image which may influence his future behavior. While primitive man was wholly surrounded by and lived in nature, modern man is wholly surrounded by and lives in a *social* environment. The direct impact of the laws of nature is replaced by that of social laws and forces—hence the tendency to view the historical and social environment as the determining factor. Man becomes less "natural" and more human and social; he becomes *man directed.*

He remains, however, aware that nature limits his potentialities. A heating plant or air-conditioning device cannot transform the climate of the Arctic or of equatorial Africa. Neither can drainage, irrigation, or fertilizer make all lands productive. Despite new inventions, man's "conquest" of the earth—his mastery of nature—does not become boundless. There always remains a limit, imposed by nature, which man cannot escape. It is this consciousness of the existence of fetters imposed by the environment that makes the German geopoliticians speak about the *Erdgebundenheit* ("earth dependence") of man and politics. We may be proud of the degree to which we have succeeded in emancipating ourselves from the dictates of natural forces, but we have to admit that modern man still remains *nature limited.*

The fact that environment influences[3] human life, in one way or another, has been admitted since ancient times and must still be admitted in our day. But the difference between the early geopolitical writings and the contemporary ones has its roots in the distinction between the *nature-directed* and the *nature-limited* man. True, the objection may be raised that what separates these early writings from modern ones is not a different notion of how much "geography" conditions man but a different concept of human nature itself. Namely, until the eighteenth century, all thinkers (perhaps with the exception of Machiavelli) considered human nature as static and fixed—fixed by God, climate, or race—while modern thinkers developed the theory of a changing and plastic human nature. However, this distinction, although real, is not sufficient to differentiate between ancient and contemporary geopolitcial thought. The modern theory of a changnig and plastic human nature does not necessarily deny de-

[3] The notion of "influence" is unacceptable to many American geographers (supported by the political scientist, Harold Sprout). The British and French are somewhat less adamant on the subject (perhaps because they never had an Ellen Churchill Semple), and the Russians are wholly unperturbed and speak of "influences [*vliiania*] of the geographical environment." The Americans argue that nature does not initiate, at least not consciously and purposely; hence it is a passive factor and cannot be said to *influence* anybody. Omitting certain philosophical questions, it remains whether such a position is correct from the semantic point of view. Does the common and professional (in biology, psychology, economics, history, etc.) use of the English language justify such an interpretation and limitation of the meaning of the word "influence?" Wittfogel (180, pp. 724, 732) has argued that a "passive" or "limiting" (but not necessarily immobile and unchanging) factor not only can exercise an influence but can even be at times the guiding (*Richtung gebend*) force. Wittfogel reaches similar conclusions on the basis of a different bibliography (181). Later he modified his ideas on this subject (182, p. 11).

terminism. History, modes of production, libido, etc., are at times advanced as determining elements (135). But modern schools of thought, even when they accept determinism, reject the earlier thesis that geographical conditions can be the decisive factors.[4] The geographical environment is thought of only as limiting the economic possibilities of a country and determining, at most, its strategic situation but not human nature per se.

Premodern Geopolitical Writers

Among the premodern writers who have analyzed the impact of the natural environment on man, Aristotle and Jean Bodin are outstanding. Their conclusions, although not unique, opened new avenues of thought and incited many writers to further research in the field.

Aristotle.—Twenty-three centuries before the word "geopolitics" was coined, Aristotle discussed many questions we would classify as geopolitical.[5] He considered the natural environment from the point of view of (*a*) its impact on human character and (*b*) its implications for the economic and military necessities of the ideal state. The inhabitants of an ideal state must be worthy, and "there are three things which make men good and virtuous; these are nature, habit, rational principle." The relation between nature and the character of the citizens "can be easily understood by anyone who casts his eye on the more celebrated states of Hellas, and generally on the distribution of races in the habitable world." Climate and national character are closely related; heterogeneity of the territory of a state breeds heterogeneity among the people and prevents the achievement of unity and peace within the country. The geographical environment molds men's characters by favoring one or another occupation, and certain ways of earning a livelihood make people prefer one kind of political regime, while other ways foster different preferences. There is a direct relationship between the goodness of people and their occupation. Hence the occupations can be classified hierarchically according to the degree of virtue they promote and the kind of regime they make possible (4, Books iv, v, and vii).

Aristotle also considers the geo-economical conditions which the territory of a state must fulfil, at which point he expresses preference for a state territory which would permit autarky and discusses problems of geostrategy, stressing the fact that geographical isolation protects a state not only from an outright military attack but also from undesirable influences. Revolutionary ideas from abroad may undermine the stability of a regime which otherwise would be able to maintain itself.

Bodin.—Bodin's climatic theories must be considered original even if they follow Aristotle's tripartite division. They are impor-

[4] Some exceptions should be noted. The nineteenth-century British historian H. T. Buckle (14) granted the physical environment a very generous share, to say the least, in the shaping of man's history. Twentieth-century German geographers and geopoliticians bowed quite often to geographical determinism (49). In America, Huntington goes far in stressing that the physical environment molds culture and individual character (58–60, 62).

[5] Some of Aristotle's views on this subject had previously been expressed by Plato, and both Plato and Aristotle seem to have borrowed from Hippocrates, who related climate to man's physical and intellectual traits (55). For a general survey of the geographical concepts in the ancient world see E. H. Bunbury (15). A selection of ancient Greek writings on geography and cosmology can be found in E. H. Warmington (172). For a historical survey of the evolution of geography and political geography since ancient times see A. Hettner (52, pp. 4–109) and O. Maull (97, pp. 1–31).

tant because they have influenced many writers, among them Milton, Montesquieu,[6] and Burke. Bodin expounds them extensively in the first chapter of the fifth book of *Les six livres de la république*.

The natural environment of each particular republic has to be considered "in order to adjust the form of the commonwealth to the nature of places and the human laws to the natural laws." Whenever the rulers have failed to do this and "have tried to make nature obey their edicts," great harm resulted, and "many a great state has been ruined." It is consequently surprising that "those who have written about the Republic have not treated this question" (6, p. 663).

Bodin clings to the concept of a fixed human nature and, puzzled by the diversity of human character, tries to explain the lack of uniformity by environmental influences. He criticizes Plutarch for not having understood why people from different regions express preferences for different regimes. He points out that the architect tries to adapt his construction to the material and site he has at his disposal. The politicians must follow the architect's example; the political structure must fit the human character as molded by the given environment.[7]

However, it must be pointed out that Bodin does not consider the geographical environment as the sole or even the most important fact in human life. He thinks that certain characteristics determined by the climate may be modified by other influences. The influence of the natural environment is regarded as one of the several factors which political scientists should, but have often failed to, consider. But, in spite of this qualification of nature's ability to determine life, Bodin remains an exponent of the premodern geopolitical school. He teaches that nature can and does not only *limit our capacity* to do certain things but also *determines our will* to do or not to do these things.[8]

Aristotle's and Bodin's geopolitical writings are representative of their times because they are primarily concerned with what *is* the unavoidable and compulsory impact of the natural environment on man and his political life. They do discuss questions which interest geopoliticians today, but their primary concern is of a natural science character. In other words, they seek the laws of nature (not the moral *jus naturale*, but the physical *jus naturae*) which govern human life in its natural setting. Hence their geopolitics strives to be an objective science about a relationship which actually exists and not one which is merely possible (or is regulated by man). Man's will being largely determined by outside

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[6] Not all scholars agree that Montesquieu was influenced by Bodin. Some think that there is only an analogy and some common knowledge of Aristotle's point of view (103). Bodin's theories have been extensively analyzed by Meuten (102) and by Fournol (29).

[7] Bodin's argument must be understood as an integral part of a philosophy of universal harmony. Man and his works must fit not only into nature's order but also into that of the whole cosmos. For instance, Bodin accepts the tripartite division of climatic regions not merely as a hypothesis or working scheme; it appeals to him because it seems in harmony with the rest of the world, particularly the order of the planets. He even tries to reconcile it with the biological elements of the human body (29, pp. 120–21, 126).

[8] Bodin is about the last to hold these views in such a generalized way. Montesquieu, although he uses similar arguments, represents a transition toward the modern view and seems to be an adherent of the so-called emancipation theory: man, in his historical development, progressively frees himself from the bonds of nature (106, Vol. I, Book XIX). The classic exponent of the emancipation theory is Hegel (48, pp. 80, 225, 241). For a discussion of the emancipation theory see Wittfogel (180, pp. 496–500).

conditions, geopolitics is, in a sense, not only objective but also amoral and apolitical.

The Modern Geopolitical Writers[9]

The contemporary geopolitical schools have, in general, abandoned the idea that the geographical environment can determine to any significant extent the nature of modern man and have, consequently, concentrated their attention on the prudential dictates of the environment. In other words, the modern geopolitician does not look at the world map in order to find out what nature *compels* us to do but what nature *advises* us to do, given our preferences.[10]

Perhaps this characterization of modern geopolitical thought may not seem entirely accurate, since *some* geopoliticians try to read from the map certain compelling dictates of foreign policy, but they are never concerned solely with geopolitics per se. They combine geopolitics with (or, more exactly, put it in the service of) certain ideas or theories, and it is only in combination with the idea of a master race, of the necessity for autarky and expansion, of the necessity to combat or spread a religious or political gospel, that modern geopolitics acquires a determinative character.[11] A genuinely deterministic school of geopolitics must accept the compelling character of the natural environment in both foreign and internal politics. Aristotle and, to a greater extent, Bodin devoted their attention primarily to the problem of what regime is possible within a given geographical setting. Contemporary geopolitics, on the contrary, rejecting the theory of a nature-molded human character (or, alternatively, accepting the theory that modern man has succeeded in emancipating his thought from

[9] Neither this nor the following sections are intended to be a review of all schools of, or trends in, geopolitics. Such a task could not be accomplished within the framework of this study. Only those writings are analyzed which, in this writer's opinion, either have contributed most to the foundations of modern geopolitical thought or, on the contrary, have contributed most to its depreciation.

[10] "Physical environment never compels man to do anything; the compulsion lies in his own nature. But the environment does say that some courses of conduct are permissible and others impossible" (60, p. vii). Huntington's statement is, however, ambiguous, because if environment succeeds in changing man's "own nature," then it succeeds also in compelling him to do certain things. Huntington's book is devoted precisely to the thesis that climate is one of the three factors (the other two being race and culture) which mold human nature.

[11] There remains one, as yet unexplored, avenue of partial revival of past theories that nature molds at least some aspects of the human character. This would be through C. G. Jung's and S. Freud's theory of "collective subconscious." If it could be shown that the psychic heritage (*psychische Erbmasses*) common to all humanity is not static but, on the contrary, enriched by the experiences of the succeeding generations (as stored in the subconscious), then the collective subconscious would vary according to the variety of life-experiences. A people living through many generations in the rough climate of northern Siberia would store in its subconscious a different kind of psychic impression than another people settled for twenty-five centuries in the sunny valleys of Transcaucasia. It follows from this that our conscious, which uses the subconscious as its nourishing ground (*Nährboden*), would be indirectly influenced by our and our ancestors' geographic environment. Jung makes the following comment on this hypothesis: "Thus I feel less sure as to whether there are such hereditary 'branches' [of the psychical predisposition], that is special differentiations due to local or racial influences. It seems to me entirely possible and even likely that such differentiations really exist despite all theoretical prejudice to the contrary. However, I have so far not found sure evidence for their existence. . . . I regret thus that I am unable to give you a clear cut answer on this question" (72).

the grip of nature),[12] has concentrated on geostrategy and the foreign-policy implications of geo-economics. The fact that, even among the so-called determinist geopoliticians of our day, so few have shown an interest in the problem of the correlation between the internal regime of the state and the natural environment is, in a way, proof that they, too, are hardly genuine determinists.

This, of course, does not mean that geopolitics should not be concerned with problems of internal politics. On the contrary, it is unfortunate that geopolitics tends to be identified with geostrategy. Geopolitics should cover all the field parallel to, and intermedial between, political science and political geography, and, indeed there have been a few such studies (13, 36, 85, 88, 159, 160).

In general, it is very difficult to give a definition of today's geopolitics. Geopolitics is a war casualty; it has been used and misused by strategists and expansionists of all shades beginning with Mahan and Theodore Roosevelt and ending with Hitler and Tojo. Propagandists and antipropagandists invaded the field of geopolitics, seeking a scientific polish for their biased arguments, and geographical ignorance, widespread within all social strata, facilitated their task. Few people realized that any map is necessarily only a distorted picture of a given area and were inclined to accept any map as a scientifically reliable document; propaganda maps were accepted as empirical evidence, because "proof" could be *seen* (7). "A verbal denial of the content of a map [has to] overcome the profound distrust of those ideas which contradict the evidence of sense impression" (136). A special technique of eye-catching maps has been developed which combines skilfully area distortion with colorful shadings and impressive arrows drawing attention to certain spots.[13] This technique may not be wrong in itself; it can help to bring into relief important facts and political problems, provided the reader of the map possesses enough critical sense.

The German geopoliticians in particular did excellent pioneering work in geopolitical education by drawing maps on most unfamiliar grids (31). We have been too accustomed to the Mercator projection and maps centered on the Europe–United States–Japan latitude, but the new maps have reminded us that the world may appear very differently according to the spot at which it is centered. This has helped us to understand why different statesmen and nations may have very different opinions about the geopolitical and geostrategical problems of the world; everyone evaluates the same problem from his own geographical perspective, and every nation thinks in terms of a world map centered on its own country (115, p. 373).

Unfortunately, during the last war both the geopolitical maps and the accompanying texts were integrated into the national propaganda networks. The result was that geopolitics ceased to be a science, or at least

[12] Jung (72) thinks that man always inherits the disposition toward subconscious representations but that, with the progress of civilization, his tie (*Verbindung*) to the collective subconscious becomes weaker and that more of the subconscious is raised to the level of consciousness. Hence it is probably more correct to assume that contemporary man has freed his character from determination by the natural environment than to deny that man's nature was ever molded by it. Primitive man, guided primarily by the subconscious, may have had his thoughts actually determined by the natural environment.

[13] Cf. Haushofer's soul-searching as to how a geopolitical map might be scientifically objective yet serve one's national interests (46, pp. 343–48). A good example of propaganda maps is found in Wirsing (178, 179).

ceased to be practiced and considered as such, and the very term "geopolitics" fell into disrepute.[14] Since World War II, many political scientists have become reluctant to engage in geopolitical research. Consequently, it might be useful to draw a balance sheet of truth and falsehood about geopolitics and consider where the errors originated and how they can be avoided.

Misunderstood Geopoliticians and Misused Geopolitics

The organic theory of the state.—Probably the most common charge leveled against geopolitics is that it is inextricably tied to what is rather vaguely referred to as the "organic theory of the state," that is, a theory which holds that all components of the state "grow" together into one "body" which has a "life" of its own.

The organic theory of the state is a philosophical (or, more specifically, a metaphysical) concept of the state. Although it may be true that "a social organization operated by men" cannot be said to have a young or old age, "since men collectively through successive generations are at no time older than their predecessors" (65, p. 185), this is irrelevant to the organic theory of the state which holds that the "life" of the state is not related directly to men qua physical organisms. The state is, in its essence, a spirit, or idea, in which, and through which, all nationals are bound spiritually into an organic oneness: into unity in multiplicity.[15] All references to a state's birth, life, or death are references to spiritual phenomena which may or may not be related to the empircial fact of appearance or disappearance of political units on the world scene.[16] It is only if we combine with, or introduce independently from, this philosophical or-

[14] K. Haushofer was quite right in pointing out that every nation has its own (i.e., subjective) geographical consciousness, but he undermined the scholarly character of his school of geopolitics when he declared that "geopolitics shall and must become the geographic conscience of the state" (46, p. 27). Obviously, geopolitics which "shall and must" be the conscience of one particular state or regime no longer strives to become the conscience and serve the values of humanity as a whole. A. Haushofer (Karl's eldest son) was well aware of the fact that "the more geopolitics strove 'to become the geopolitical conscience of the state,'" the more it became "subservient to the political will" and to the demands of current politics (43, p. 19). In America some felt that Spykman's work was part of "the crop of current war propaganda books emanating from our universities" (16, p. 17).

[15] The concept of the state as a community based on a transcendental spiritual union is not exclusively German or specifically Hegelian. It has deep roots in Russia, particularly in the writings of A. S. Khomiakov. The concept of *soborna Rossiia* is typically a metaphysical organic concept of the state, and the problem is not whether a state or nation *is* an organism. It is whether men *ought*—in accordance with their inner nature—to seek such an organic unity in the common endeavor to attain certain goals which are beyond the reach of men qua individuals. These are, of course, purely philosophical questions, but it must be remembered that many Russian, German, and other thinkers are not likely to separate the physical from the metaphysical realm. They see in the empirical world either a material expression of the spiritual or merely a stepstone in the ascending movement toward a higher stage—toward the spiritualization of all the material. Consequently, the organic unity of the transcendental world is necessarily assumed to be either reflected in the physical world or present in it *in statu nascendi*.

[16] For many a Russian the 1917 Revolution meant the death of the fatherland; for others it marked the birth of a fatherland. There was even an official attempt to deny any legal connection between tsarist Russia and the Communist Soviet Union. In fact, whenever the question of recognition of a new regime, or of acknowledging the formation or demise of a state, is raised in terms of international law, the underlying issue is that of correlation between the empirical (material) and non-empirical (spiritual) "life" of a state and/or nation.

ganic theory of the state the empirical concept of the state area as a geographical-biological organism that we descend into troubled geographical and geopolitical waters (40, p. 256; 52, p. 252). The philosophical distance between America and continental Europe (esspecially Germany and Russia), together with a peculiar American distrust of all metaphysical thinking, led to much misunderstanding of some of the European political and geopolitical writings.[17]

If we take a closer look at the writings of the two most important among the founders of modern geopolitics—Ratzel and Kjellén—we see that much of the criticism to which they were, and are, subjected is not well founded. Neither of them submerges the individual within a state organism. Ratzel stresses that within the state, a "most imperfect" organism, "men maintain their independence and not even as slaves could they lay it aside." They may at most "sacrifice their free will when bending it at one occasion and putting it in the service of the whole at another." Nations and states "are not organisms properly speaking but only aggregate-organisms" the unity of which is forged by "moral and spiritual forces" (112, Part I, p. 2). The state is a "spiritual and moral organism. The spiritual nexus unites that which is physically separated and for that very reason the biological comparison is no longer suitable. What leads and guides the state organism in the spiritual realm is precisely that which reaches beyond the world of the other [i.e., biological] organisms" (115, p. 11).

Kjellén, always considered the chief villain of the organic theory, *seems* to make it clear from the beginning that he treats the state as a living body. His state has a life, growth, old age, and a time of death. It has also both a body and a soul and is subject to the laws of life. But ultimately, and despite Kjellén's use of an organic-theory vocabulary, one cannot but conclude that he speaks in metaphor. The individuals and the nation are to him more important than the state. The nation can survive the disappearance of the state, but the state "loses all hope" of revival if the nation becomes extinct. Hence "the state appears to be an accidental being while the nation is the true being." But not even the nation—a multitude united into one living being—is the most important factor in the life of the state. Kjellén reaches a conclusion that is "both from the practical and theoretical point of view of immeasurable importance: *the life of the state is, ultimately, in the hands of the individuals*" (80, pp. 218–20).

Had Kjellén actually conceived the state as a living organism, he could never have permitted the individual to remain independent and still less to retain the power of life and death over the state. His state has at no time any truly independent life. It does not approach, even remotely, the sovereign status of Hegel's *Weltgeist* or Marx's "material forces." And, although "our organic theory shows its superiority also in the fact that it gives the state a goal of its own," this goal of the organic state is hardly different from that of any democratic state, namely, "the welfare of the nation" and "improvement upon the [moral] inclinations of the people." Moreover, Kjellén insists that the power of the state to seek the national welfare ought not to be unlimited; it

[17] E. Troeltsch noted the lack of understanding between Germany and the countries to the West, a difficulty generated by the "permanent problem of the difference between the German system of ideas—in politics, history and ethics—and that of western Europe and America," while "the works of Kjellén supply clear evidence of the affinity" and "natural kinship" which exists between the Germans and the "conservatives of all countries, and especially in northern Europe, [which] is largely under the intellectual influence of Germany" (163, p. 201).

ought to be circumscribed "where the individual has a goal proper to his personality [*Persönlichkeitzweck*]" (80, pp. 228–32).[18]

We have to conclude that, although Kjellén insists that the state is "something different than the sum of its parts" and that it is a personality, "a true personality with a life of its own, and not a conglomeration of individuals" he does not think of the state as an organic biological-geographical body. He does not want the state to be regarded as "an abstraction," but his theory goes little beyond the organic analogy which was so popular in the Middle Ages.[19] His chief interest is to combat the legalistic concept of the state which prevailed in his day and which conceived of the state merely as the sum of the the articles of the constitution and other basic laws. "In short, Kjellén began to conceive states not as legal bodies but as Powers" (158, p. 166).[20]

Kjellén accepts as a sign of maturity and sound realism the trend toward an emphasis upon practical ("materialistic") considerations in both national and international affairs, but he rejects any teleology of state based on materialism and hedonism which would stress the *is* to the detriment of the *ought*. He is arguing (1) for a modern concept of the state and a political science outside the faculty of law, and (2) for a Rousseauian "return to nature," away from the abstract and artificial conception of the personality of the state, that is, to nature as embodied in the "geographic personality" of the state and to human nature as manifested in the "healthy instinctive life" (80, pp. 1–6, 230–32). Kjellén is not an untypical Central European "progressive conservative" of the pre–1914 vintage with ideas ahead of, but not entirely disassoci-

[18] Nothing said above should be interpreted as meaning that Kjellén believed in equalitarian democracy. On the contrary, he favored a hierarchical and elitist society in which, as in classic and medieval political philosophy, duties prevail over rights. Although Wittfogel (180, pp. 31–37) branded him a trail-blazer of fascism, he was a rationalist, and his nationalism was qualified. For Kjellén, well-developed and self-sufficient "national personalities" were not incompatible with, but a prerequisite for, a European union which he favored. Much about Kjellén's political philosophy can be learned from an essay he wrote during World War I (77).

[19] It is interesting to note that the French historian-geographer Lucien Febvre, a vigorous critic of Ratzel, writes in a vein quite reminiscent of both Kjellén and Ratzel, especially the latter: "To us they [the great nations of the modern world] appear, *and justly so*, like actual historic and moral personalities. They have their inner life and their own character, but also their physical individualities, their exterior shape, and their material figure, which is so distinct and familiar that we never think of them under any other aspect than their present one; their shapes seem to us today to have a sort of eternal necessity" (26, p. 296). (My italics.) For the best example of medieval organic analogy see John of Salisbury (119, Book v, chap i). Kjellén himself states explicitly that his organic theory of state is only an analogy (80, pp. 65, 79).

[20] In general, Kjellén seems to draw on Hegel, except that, while the latter says (*Philosophy of Right and Law*, par. 269) that "this [the state's] organism is the political constitution," for Kjellén the state is an organism precisely because it is something more (or, rather, different) than its constitution: the state as a form of life is a power. "The great power [*Grossmacht*] is a concept which is not mathematical but dynamic, not ethnic or cultural but psychological. . . . The great power is, above all, a will richly endowed with power means" (74, p. 199). In this respect Ratzel is truer to Hegel's philosophy than Kjellén. To Ratzel the state is an organism primarily because it is an expression of a living culture and not because it is a phenomenon of power, will, or psychology; the cultural growth or decay of a nation *precedes* the growth or shrinkage of the state as a power (114, pp. 98–100). Ratzel and Kjellén differ only in emphasis, but the difference is significant. While the former tends to be a philosopher (153), the latter is a so-called power realist.

ated from, the world view of a Bismarck or even a Pobedonostsev.[21]

The aim of Kjellén's quasi-organic theory is to show that the state is not the dead letter of the law but, on the contrary, a changing and living community in which the territory, the human beings, and the nation as a whole interact. The vicissitudes in the life of the state and in the relationship between the elements composing the state can be considered as signs of the health, growth, decay, or even death of the state.[22] But at no time is the individual sacrificed for the sake of, or irremediably absorbed by, the state or nation. The individual's own personal goals are respected, and it is his will which ultimately decides the fate of the state.

Geopolitics and geographical determinism.[23]—There is undoubtedly a great danger that geopolitics, or, more exactly, politics based on geopolitics, may lead to the acceptance of geographical determinism. This was long ago recognized by Ratzel. "The *only* material element of a state's unity is its *territory*. Consequently there is a strong temptation to base the political organization primarily on the territory of the state as if it could force into unity *always discrete* men" (115, p. 15).[24] Geopolitics has been called upon in order to attract the attention of the statesman to the geographical factor, an often neglected factor in politics. But if one jumps from one extreme to another and, instead of integrating geopolitical knowledge with the rest of political knowledge, tries to subordinate all other factors to the geographical, then the picture must become distorted.[25] The importance of the geograph-

[21] There was in the Germany of Kjellén's time a lively interest in the physical geographical environment among both Marxists and anti-Marxists, a movement that partly explains the rise of German geopolitics. Some revisionist Marxists (e.g., Georg E. Graf, a Kautsky follower) thought that Marx, preoccupied as he was with social-philosophical, economical, and class-struggle problems, had overlooked the importance of nature as the material base of all life-phenomena; hence Marxism needed to be complemented with a geopolitical theory. The anti-Marxists, on the other hand, turned to the natural environment in order to de-emphasize legalism and to provide, at the same time, their non-materialistic political theories with an empirical foundation which would differ from Marxist economism. All too often, however, they did not go beyond a kind of revived geographical materialism *à la* Montesquieu.

[22] Ratzel quotes Horace Greeley's phrase, "Go west, young man, and grow up with the country," as an example of intimate relation and growing-together of people and land (113, p. 226). The American concept of "living constitution" could also be shown as related to Kjellén's theory of the state as a form of life. Still, one cannot deny that the organic analogy may be misleading or worse because of its tendency "of developing into direct statements of facts" (40, p. 257).

[23] For an extensive review and critique of the more recent determinist, environmentalist, possibilitist, etc., schools of thought see studies by H. and M. Sprout (138, 140) and G. Tatham (154). Among geographers who dealt with, and fought, environmentalism we must note R. Hartshorne (41) and R. S. Platt (110). For a sympathetic appraisal of environmentalism and determinism by a group of British geographers see Spate (135, pp. 424–28). Another geographer, G. Taylor, agrees with Wittfogel on the ultimately decisive importance of the environmental-economic factors as forces guiding human actions (155, pp. 445–46).

[24] Writing about the Pan-American movement, based on the idea that territorial unity should go hand in hand with political unity, Ratzel asks the question: How important, in fact, is the territorial oneness? His answer is that ethnographic diversity is politically of greater importance than geographic unity. "No sea could divide Central America from North America more deeply than the origins and histories of their people divide them now" (113, p. 230).

[25] It must be remembered that out of the several meanings given to the term "geopolitics"

ical environment is magnified, and it becomes the determining force.

The French geopolitician Jacques Ancel thinks that the French school of geopolitics has avoided the pitfalls of environmental determinism because its inspirer, Vidal de la Blache, succeeded in striking a balance between geographical fact and human will and initiative.[26] Ancel's German colleague, Otto Maull (whom Ancel criticizes for alleged determinism), is also of the opinion that geopoliticians must look upon man as a free agent. "This tie [of geopolitics] to the environment is, however, never deterministic; not even in respect to the ultimate and most important, and more or less rigid looking, geographical factors" (99, p. 54). Maull thinks that in our day man's traditional relation to environment has been basically altered. Man has succeeded in overcoming space and succeeds now in overcoming much of nature's hostility; he has learned how to take advantage of the opportunities offered by the environment and how to circumvent its adversities. "It is consequently impossible for the geopolitical deduction to think of the world without thinking about man. In his highest spiritual form, in his personality, which Kant calls 'the freedom and independence from the mechanism of nature,' man appears simply as the active and determining element" (99, pp. 54–55).

Insofar as Kjellén is concerned, we must note that, regardless of whether we agree or not with his political-philosophical concept of nation and state, the geopolitics of his school do not imply geographical determinism and/or the concept of the geographic area as an organism (73, 79). In fact, we observe that Kjellén's "political immorality"—his stress on the power struggle and the depreciation of the role of morals and law—is precisely due to the fact that he thinks of politics as being guided by men and their passions. Wars, expansion, and breaches of international law are, according to Kjellén, not due to some fatalistic and deterministic force standing outside men but to the will and self-preservation drive of men, nations, and their leaders (80, p.

Kjellén favored the most restricted one: "Geopolitics is the study of the state as a geographic organism or phenomenon in space; that is as land, territory, area, or, most pregnantly, as country [*Reich*]" (80, p. 46). In this sense geopolitics is the study of the country from the point of view of its location (topopolitics), form (morphopolitics), and area (physiopolitics), but it remains merely one of the five political science fields of Kjellén's comprehensive system of politics, the other four being demopolitics, ecopolitics, sociopolitics, and cratopolitics (75, p. 3; 76, pp. 61–103; 158, pp. 165–66, 177). The original and fundamental distortion brought about by the Haushofer school of geopolitics was that the term "geopolitics" was applied to the totality, and more, of Kjellén's system of politics. "Kjellén himself acknowledged this 'German' use of the term—by complaining of its being misused" (158, p. 166). The second and final distortion occurred when, from about 1934 on, the Haushoferians included in *their* political-geopolitical system Nazi racial theories; thus Kjellén's system of politics was replaced with Hitler's. Richard Hennig was one of those German geopoliticians who strenuously objected to the burdening of the "until now tolerably clear concept of geopolitics" with "fashionable" tendencies and subjects which are wholly unrelated to it (51).

[26] "Although the French school [of geography] went to Ratzel for its first lessons in human geography it has avoided being captivated by physical geography thanks to the vigorous spurt it received from its founder, Vidal de la Blache. The latter paid homage to the Germanic science but he has freed man from a too severe fatalism. In the determination of geographical facts he made more room for human will and initiative than the German did. For him Nature was not all" (2, p. 17). But Ancel is incorrect in implying that Ratzel was a "severe fatalist" or that nature was everything to him (153).

29).[27] A realistic concept of the state must take into consideration not only the moral, rational, and legal framework of the state but also the "organic drives" manifest in the state's real life, that is, the instinctive, amoral, or immoral impulses of its inhabitants. The German "Not kennt kein Gebot" or the American "My country right or wrong" are neither legal nor moral rules of conduct, but one cannot overlook the role they play in the national and international life of these states.

Kjellén insists that law alone does not determine politics, but he does not substitute geographical determinism for legal determinism. The criticism which Kjellén has received is not undeserved, but it is usually misdirected. His mistake lay not in conceiving of man as directed by environment or an organic state but in exaggerating his freedom. Specifically, he sanctioned as natural the instinct of men and nations to satisfy their desires at one another's expense. Kjellén's followers concluded that this instinct, being natural, must also be good.

A second point on which Kjellén can be justly criticized is his unconditional acceptance of the premise that autarky is good and necessary. The concept of *Lebensraum* is intimately related to this premise. Similarly, the notion of what constitutes a "natural frontier" depends on whether autarky is the set goal. Autarky is, in modern times, an unattainable chimera, and it has led only to conflicts among nations; it assumes that international economic collaboration is impossible or undesirable; hence interdependence is dangerous. Autarky fosters the belief that states can, and should, be self-sufficient ecopolitical "organisms," and it is either justified in terms of strategic necessities, or, as in Kjellén's case, it seems to be based on moral considerations rooted in the old pro-agrarian and natural economy bias (80, pp. 75–77).

In general, two observations should be made on the subject of geographical determinism. One is that many a discussion and controversy on this subject is marred by a lack of clarity as to what is supposed to be determined: human *will* or human *actions*. On the one hand, the geopoliticians whom this writer calls premodern (e.g., Aristotle and Bodin) tend to stress, although not exclusively, the environmental determination of man's character, that is, of his will. Some contemporary authors, who base themselves on certain psychological and physiological-ecological data, do the same;[28] the same may be said of some geographical-historical theories when combined with historical determinism (48, 59, 92). On the other hand, those who think about determinism in terms of human actions consider that the environment does not impair man's will but merely eliminates, under certain circumstances at least, all possible alternative courses of action. The appraisal of this concept of environmental determination of actions depends on our view of the broader problem of how important and decisive in human life is the so-called realm of necessities: to what degree man is driven by the desire for both individual survival and survival of the species and what such a struggle for survival implies, that is, at what point there is indeed only one possible path, all others leading, directly or indirectly, toward

[27] The "political immorality" of Kjellén should be qualified. Kjellén does not deny that nations and states show a basic tendency toward reasonableness and thinks that the trend is toward the development of higher moral standards in international relations.

[28] See the works of W. Hellpach (50) and M. Sorre (132). Perhaps the most extensive research along this line has been undertaken by the Russian anthropologist Sergei M. Shirokogoroff. Some of his works have been translated into English (130, 131).

sudden or slow extinction.[29] It is precisely a different concept of the relationship between environment and survival that spurs writers with a Communist world view to some of their most violent attacks against "bourgeois geopolitics."[30] A large part of these attacks is, quite obviously, propaganda. But there are also differences of opinion of substance. For instance, Communist writers hammer at the so-called Malthusianists and see in William Vogt's *Road to Survival* a classic example of geographical determinism on the grandest scale. According to Vogt, certain countries, and even the world as a whole, "quite literally *cannot feed more people*"; hence, "there can be no way out," and we must either reduce birth rates (the reduction of death rates is seen by Vogt as "the greatest tragedy"), or "millions more are going to die" of starvation (167, pp. 224–25). To the Communists this is nonsense because in their opinion the environment does not force mankind, not even the Chinese, to adopt policies limiting the birth rates, and they think that they have already set examples to prove their point.[31]

This leads us to the second general observation, namely, that the problem of geographical determinism is not a self-contained one. It represents only one aspect of the over-all problem of determinism versus indeterminism (and mind versus matter) both on the level of the physical sciences and on that of philosophy.[32] Many a statement thrown into the boiling pot of the controversy about geographical determinism would undoubtedly be modified, or withdrawn altogether, if all its ultimate and teleological implications were realized (135, p. 419). Unfortunately, the trend toward a fragmentation of knowledge and isolation of the particular fields of study, together with the divorce of philosophy not only from the physical but also from the social

[29] When environmental factors are considered in their relation to man's possibilities for survival, the time element becomes very important. All too often misunderstandings arise as to the meaning of geographical determinism because it is not stated for how long—a few days, years, or centuries—this or that environment is to be considered as determining our actions. The importance of environmental impediments is relative to the time limit within which we have to develop the techniques and/or gather the means for overcoming them. The "time distance" from the consequences with which a given natural element (e.g., a typhoon, a winter season, or an Ice Age) menaces us is usually the decisive factor. An element may determine our lives today, but by tomorrow we may be able to control it.

[30] For an exhaustive exposition of the orthodox Marxist point of view on this subject see the excellent study by Wittfogel (180). However, we must note that the Stalinist Communist theory has departed somewhat from the Marx-Engels (and Plekhanov's) strictly materialist concept of man-nature relationship and is closer to K. Kautsky's and N. Bukharin's voluntaristic teachings, which, in Wittfogel's opinion, are "leading [away from Marx and] toward a new and original form of idealistic subjectivity." For an exposition of the contemporary Soviet theory of the man-nature relationship see Ivanov-Omskii (63), Voskanian (168–69), and Saushkin (121).

[31] For the most comprehensive, albeit most virulent, Communist attacks on American and other "bourgeois" geopolitical writings see Grigorev (33) and Semënov (124). For an example of similar attacks from the pen of Soviet "satellite" writers see a study published in Poland (56), but the reader is warned that this is literally a "satellite" piece of writing; one looks in vain in the thirty pages for original scholarship or thought. Much better, quite thorough as far as research is concerned, is a study by an East German, Günter Heyden (54).

[32] For an attempt to deal with the problem of geographical determinism as an aspect of determinism and indeterminism in general see A. F. Martin (96); his position has been criticized by E. Jones (66), who chooses to argue on a level below the philosophical one.

sciences, makes a meaningful discussion of certain general problems very difficult.

Politics and Geopolitics

Whenever we look at *our* environment, we do so specifically from *our* point of view. One cannot speak of the environment abstracting from that which is environed. Hartshorne has pointed out that the so-called natural geographic regions are not natural in themselves but may, at most, be considered natural only with reference to man and his subjective perspective.[33] This would not create great difficulties if man qua man, and as distinguished from other species, had one particular and specifically human view and perspective of the environment. But men have divergent scientific, philosophical, and teleological ideas as to what they themselves are, or should be, and, accordingly, differ also in their interpretation of the environment; as the self-image of the environed unit varies, so also its image of that which environs it varies. As long as we discuss some broad physical geographical concepts, like climatic or vegetation zone, the differences can be minimized even if such zones are defined in terms of man the observer and his habits and needs. But, once politically relevant problems are broached, agreement becomes difficult.

We speak of natural regions, and their limits ("boundaries"), without stirring too much controversy. We cannot do the same with the so-called natural boundaries of states, although these are, essentially, neither less nor more natural than are natural regions. State boundaries touch too closely one's particular cultural heritage and political beliefs to permit their acceptance on the basis of a vague universal human consent. It is for this reason that boundaries of political units cannot be supported by some general human principle—and in this sense be natural, that is, in accordance with human nature objectively perceived—and will always remain in the domain of politics and a result of compromises. What is political is intrinsically controversial, hence not natural, or, more exactly, not universally accepted as natural.

One of the greatest misconceptions, sometimes perhaps the result of conscious fraud, in certain geopolitical writings can be found in their claim to solve political and moral questions by appealing to the non-political and amoral, specifically, to external nature: to the natural of the non-human world.[34] The natural of the human world cannot be substituted by the natural of the animalic, botanical, geological, topographical, or any other world. Not even the natural of man qua physical being can be confused with the natural of man qua moral (spiritual) being. This even if we believe, as Aristotle did and as all theistic philosophy teaches: that the universe is not a chaos and that there is an ultimate harmony and order among all the elements both material and non-material.

Like those who rely on physical anthropological characteristics (e.g., skin color) to bolster their intrinsically moral decisions, so geopoliticians all too often have mar-

[33] "A map of 'natural regions,' or of 'regions based solely on natural elements' with reference to mosquitoes, would be entirely different from one made with reference to sequoias, but any such division must be made with reference to some such ulterior concern. Needless to say, all such divisions by geographers have been made with reference to man's point of view—nature as man is concerned with it" (40, p. 300).

[34] Confusion and deceit are facilitated by the fact that the word "natural" is used in two different senses: (1) in the sense of conforming to man's moral nature and teleology and (2) in the sense of pertaining and conforming to nature qua physical world, its order, and its laws.

shaled facts and laws of the physical world to justify political demands and support political opinions. One of the best examples of the hopelessly contradictory arguments to which this may lead is a concept akin in spirit to that of the "natural boundary," namely, the concept of the "harmonic state."

> The greatest liberties with scientific procedure have been taken in considering the "harmonic" or "disharmonic" character of state areas. Because Hungary, deprived of its former surrounding territories, can be shown to have a disharmonic (or non-organic) form, the student who is also a citizen of one of the "revisionist" states concludes that *therefore* these peripheral areas should be reunited to Hungary. But this must logically suggest that Belgium must be given more agricultural land, whether from France or Germany; that the Netherlands must be extended into the Rhineland, or vice versa, and so on until the whole map of the world would have to be redrawn, only to find that few, if any, states would even then be really "harmonic" [42, p. 958].

A few years after Hartshorne wrote this perceptive observation, the Hungarians succeeded in making partly good their revisionist claims and establishing something close to what *they* considered a harmonic state area. But then their neighbors began to contend in terms of geopolitics. What seemed like a harmonic geopolitical area from the point of view of Hungarian historical, economical, and political aspirations looked rather disharmonic through the prism of a different culture and its ideals. So, the Rumanians argued[35]—quite in accordance with the spirit of Kjellén's teachings—that that which creates unity and harmony are linguistic and emotional ties and not factors of physical geography. A row of mountain peaks and a water divide do not break up the unity of and harmony among the Rumanian peasants living on both slopes of the Carpathians. While the Hungarian geopolitics sought supporting facts in physical and economical geography, that of the Rumanians was rather based on cultural anthropological geography—as interpreted by them, of course.

Geopolitically harmonic states, as well as natural boundaries, could be imagined only if certain fundamental and universally accepted agreements were reached, that is, first would have to come the necessary political consensus and decision, and then only something could become (or, rather, would begin to be considered) natural or naturally harmonic—a natural idea, or natural law, is the necessary precondition and basis for a natural order; without it there is nothing natural in the polity. Genuinely natural is only that which is, or which *springs* from that which is, common to all men.

What has been sometimes attempted, and is wholly untenable, is to reverse the procedure and insist that nature, that is, facts of the physical world, take, or show preference for, this or that political choice. In other words, the natural of the environment precedes and supersedes the political and the moral—the natural world assumes the role of the human world—and the political is depoliticized, and the moral neutralized, by being referred and reduced to the physical and mechanical. Like Lenin, who, elaborating "scientific materialism," said that government and politics must give way to "administration of things," so some geopoliticians have attempted to transfer problems of geopolitics to the domain of a kind of scientific geo-administration. The political aspects of boundary questions have been

[35] A Rumanian writer (20, 21) specifically denies that the Carpathians are a natural boundary and insists that, even if the Danubian basin may form one geographical unit, it does not follow that it also must form one political unit. Ethnic considerations require divisions which differ from geographic and/or strategic boundaries.

treated as if they were purely technical and empirical matters, as, for instance, is the marking of boundaries. All these attempts are nothing but steps backward to geographical materialism and the premodern geopolitics and its conception of man rather as a part of natural history than as a history-maker.[36]

Natural boundaries and harmonic state areas are ideals—they are goals which a society considers it *ought* to attain as part of, or condition for, the fulfilment of its mission or idea.[37] Their concept springs from and changes with the teleology of the given society. According to the "Manifest Destiny," America's natural boundary was the Pacific Coast. Later, under the spell of the "New Manifest Destiny," the natural boundary of America was seen as running somewhere midway through the Pacific, or even farther, where the Americans had the mission of protecting, converting, and civilizing "little brown brothers." When termed "natural," boundaries are usually falsely called so because they are an expression, or wish, of a particular society (nation) and its particular ideal which is not shared by, and often in conflict with the ideals of, other societies. Only rarely, if ever, do two countries agree, throughout a longer historical period, that the boundary they share is just, satisfies their mutual interests, and represents the ideal limit for their national aspirations and/or missions.

In a way, the concept of natural boundary is, ultimately, self-contradictory. The natural boundary par excellence could be only that which is an expression of the ideal of a world society: of an idea which binds all men within an ideal bound. It could not be a boundary which separates men from men. Thus the realization of that final natural boundary would coincide with the lifting of all existing boundaries. At the risk of annoying some readers, we may borrow Hegelian parlance and say that national boundaries are an expression of the dialectics among national ideas; each is only half-natural, each represents either the thesis or the antithesis. The idea of the natural boundary transcends this dialectical stage. It belongs to the synthesis which lifts humanity into a different world—into a boundary-less world.[38]

[36] See discussion of the natural and the man-made equilibrium by L. K. D. Kristof (82). The failure to pay the political and moral its due seems to be not only the result of a misguided empiricism and scientificism but also, especially in Germany, of a bureaucratic spirit. "The fundamental tendency of all bureaucratic thought is to turn all problems of politics into problems of administration. As a result, the majority of books on politics in the history of German political science are *de facto* treatises on administration. . . . The functionary fails to see that behind every law that has been made there lie . . . *Weltanschauungen*" (95, p. 118).

[37] "A whole philosophy of history was comprised in that word 'natural.' When we speak of natural boundaries, we mean those fixed by destiny, ideals to conquer and realize. Between actual and natural boundaries there is often a divergence. This is annoying. It will—it must disappear!" (26, p. 297). Ratzel speaks of the *Staatsidee* as the centripetal (binding) and guiding force of the state. Some concept of natural boundary is inherent in every *Staatsidee*. The same is true (except as indicated below in the following note) for the concept of *raison d'être* of the state which Hartshorne is using (38).

[38] It is doubtful whether the idea of a natural boundary is compatible with an atomistic and laissez faire concept of society. A night-watchman state does not guide the society toward a positive common goal and ideal. It facilitates only the pursuit of goals and ideals of the multitude of individuals. Since in America the so-called procedural definition of democracy seems to prevail—"substantial democracy" is advocated chiefly by the natural law school of thought—the concept of natural boundary immediately arouses suspicion because the crucial word "natural" implies a certain uniformity and, in the realm

Geographers and Political Scientists

The reduction of the political to the natural (i.e., physical geographical) has been practiced, in a way, also by the critics of geopolitics. Apparently in a misguided desire to keep the discussion on a strictly "scientific" and "objective" (the so-called value-free level), some critics have sharply attacked various geopolitical writings, as if all their fault was on the geographical side, while, in fact, what was really objectionable was the Weltanschauung which animated them. Haushofer, not to speak of Kjellén and Ratzel, was time and again accused of being a thorough and complete geographical determinist—which he was not. However faulty Haushofer's geographical data and knowledge may have sometimes been, the real issue was political and moral, not geographical. Edmund A. Walsh was quite correct when he emphasized the moral questions. In his opinion, Haushofer's writings "contain about fifty, or even more, percent of useful truth," but, at the same time, their political ideas and conclusions could not but remain unacceptable (171, pp. 8–9).[39]

The problem of necessary coexistence of geographical and political concepts and knowledge in geopolitics, and in political geography, too, raises the question of geographical education among political scientists and of political education among geographers. That such an education in, and understanding of, each other's field was, and undoubtedly still is, wanting can be well illustrated by recalling an incident involving a geographer and a political scientist, Isaiah Bowman and Nicholas John Spykman, both of whom have exercised considerable influence on American and European political geography and geopolitics.

Early in 1942 Spykman published his *America's Strategy in World Politics: The United States and the Balance of Power* (144). This book (which claims to be "a geo-political study of the most basic issue of American foreign policy" and to offer "an analysis of the position of our country in terms of geography and power politics") earned for its author, not undeservedly, the title of the American Haushofer, not because of the subject it treats, but because of the spirit it represents. In fact, it is even

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of moral philosophy, subjection of all men to one set of duties for the sake of a supreme universal goal; even more, implicit in it is perhaps also the idea of an actual, or to be sought after, organic unity within the nation and/or of mankind as a whole. Procedural democracy stresses the freedoms *from:* the word "natural" is associated only with liberty, that is, precisely with freedom *from* the tutelage of any natural goal and duty except respect for that freedom itself.

[39] Haushofer insisted that only 25 per cent of history can be explained in terms of earth-bound factors. For the explanation of the rest one has to look to man and his initiative. "The geopolitical point of view necessarily requires a completion on the heroic side of man—a supplementation with the veneration of the heroes—because geopolitics can, on the basis of earth-determined causes, explain only one fourth of all the questions related to human development" (45, p. 6; 46, pp. 47–48; 47). It is this 75 per cent "supplement" to the "earth-determined causes," this supplementation of the geographical with "veneration of the heroes," that led Haushofer's *Geopolitik* into the Nazi political movement. For ample documentation, showing instances in which the editors of the *Zeitschrif für Geopolitik* (K. Haushofer and K. Vowinckel) have explicitly identified the politics of their geopolitics with Hitler's politics, see Heyden (54, pp. 491–94). For a comprehensive appraisal of German geography and geopolitics in the Hitler era see C. Troll (164); for an up-to-date and more severely critical appraisal of German and other schools of political geography and geopolitics see P. Schöller (123). For a Swiss and a French opinion stressing that German geopolitics has contributed positively to geographical knowledge and that the term "geopolitics" should be retained see E. Winkler (177) and L. Champier (17).

more of a moral wasteland than any work which came from Haushofer's pen. Its author explicitly advocates a policy of disregard for moral principles.

> The statesman who conducts foreign policy can concern himself with values of justice, fairness, and tolerance only to the extent that they contribute to or do not interfere with the power objective. They can be used instrumentally as moral justification for the power quest, but they must be discarded the moment their application brings weakness. The search for power is not made for the achievement of moral values; moral values are used to facilitate the attainment of power [144, p. 18].

Having read the passage, Hans W. Weigert observed that "this is the voice of destruction and nihilism" (173, p. 31), and Edward Mead Earle commented that "Bismarck would not have gone so far as regards the imponderables, and it is largely because Imperial Germany from 1890–1918 followed the Spykman thesis that the world, including Germany, has been brought to its present sorry state" (23, p. 96).[40] But Bowman, writing immediately after the book appeared in print (and thus probably without the benefit of some reviews which might have given him second thoughts), does not seem to have grasped at all the ultimate implications and price of the kind of power politics and strategy advocated by Spykman. Praising Spykman's book most enthusiastically, he recommended first reading certain other works, especially Morton Fullerton's *Problems of Power*, because "Fullerton's book . . . treats the theme of Spykman's book in similar fashion" and "professor Spykman picks up Fullerton's torch and carries it magnificently." According to Bowman, "on ground of merit and public value *America's Strategy in World Politics* should be read in not less than a million American homes" and should also be "read once a year for the next twenty years" by all policy-making government officials (12, p. 150).

It was only after a storm of protest arose over both Spykman's book and Bowman's enthusiastic indorsement that the latter realized the true meaning and "spiritual affinities" of Spykman's ideas.[41] Claiming to defend the honor of American geography, but, in fact, engaged in a very personal defense,[42] Bowman completely reversed himself and, without ever mentioning *America's Strategy* or his review of it, roundly condemned power politics. He went to great pains to refute precisely that political philosophy which he had praised so highly in Fullerton and Spykman only a few months before. Quite correctly, Bowman pointed out that his past record identified him with those who strive for a world order based on justice and not on might.[43]

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[40] Another American geopolitician, this one a geographer, who went overboard in embracing the cult of power was G. T. Renner (116). Andrew Gyorgy noted (35, p. 255): "Professor George T. Renner [is] the most notorious in recent geopolitical literature [who indorses] views derived from Haushofer, [while] Spykman is the most noteworthy."

[41] J. Gottman (32, p. 62) pointed out that there is nothing new in Spykman but "only a repetition of Mackinder's thesis accommodated to a cartography centered on America" and a "heavy borrowing from the writings of *Geopolitik* and the Machiavellic spirit of *Mein Kampf*." See also E. M. Earle (23, pp. 104–5) and the observations on Spykman and Mackinder in Schöller (123, p. 10).

[42] "The current discussion of German geopolitical writings involves the names, outlook, and reputation of certain American geographers, my own included" (9, p. 646).

[43] While he had formerly praised Fullerton's and Spykman's "realist politics" for their recognition of power as the decisive element in international relations, now he denounced the "poisonous self-destroying principle" of power politics (9, p. 646). His brusque reversal on the

While Bowman's temporary indorsement of a totally amoral type of politics was due not to the world view he held but to a misunderstanding of the underlying issues of political philosophy, Spykman, a political scientist by training, was fully aware of what he advocated.[44] His *geopower-politics* were a reaction to his disappointments with the League of Nations (which he had supported in its time) and reflected a specific concept of what human nature is and how it should, or, rather, must be, "tamed" politically.[45] But, since Spykman knew what he wanted and why, it is not necessary, for the present purpose, to question whether he was right or wrong on this point. It is more interesting for us to note now that, given his power politics, it is the "geo" of his geopolitics that is quite off the mark. Indeed, geographers have noted the surprising "cartographic immaturity" of Spykman's works (37, p. 6), which is, at least partly, "responsible for the exaggerations of his claims" (173, p. 10). Even more, Spykman does not seem to have been really familiar with certain basic geographical data of the countries he discussed (144, p. 134; cf. 23, p. 96). Consequently, it is not surprising that the policies he recommended were hardly suitable for the attainment of those power objectives with which he was so concerned. Writing toward the end of 1942, E. M. Earle noted (23, p. 102), almost prophetically:

> Should we follow Mr. Spykman's advice in Europe and in the Far East, the logical outcome would probably be that we would rid ourselves of the German-Japanese alliance only to be threatened by the squeeze of a much more dangerous and more powerful Russo-Chinese coalition. In fact, the strategy which Mr. Spykman recommends might prove to be not a policy assuring the balance of power but a policy which would cause us to lose both our shirts and our souls.

Political Geography and Geopolitics

Our discussion of Bowman and Spykman points to the fact that, in order to study, both constructively and critically, the area of knowledge in which geography and political science meet, and necessarily overlap, a two-sided effort must be made. The bridge linking geography and political science must be built from and by both sides; everyone knows best the advantages and pitfalls of his own embankment and ford approach. To be sure, this bridge must be rather floating than rigid, because boundaries between fields of study are as changeable and difficult to fix as riverbeds.

To attempt to define geopolitics would be both difficult and premature at this stage. It would be difficult because there is no universally accepted definition of geography,[46] and political scientists have seldom

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subject of Spykman's geopower-politics provided the Soviet geographers with a wonderful opportunity to ridicule and attack American geography—an opportunity they did not miss when the cold war grew colder (see Zhirmunskii [184, p. 37]).

[44] Spykman did object to being called an exponent of "cold-blooded power politics" (146) and later modified his statements, but he never repudiated either the premises or the guiding thought of *America's Strategy*.

[45] Fundamental to Spykman's thinking is that in international politics there is no escape from the Hobbesian state of nature of *bellum omnium contra omnes*. Spykman derides the notion that there ever is peace ("temporary armistice called peace") and disapproves the "tendency to look upon peace as normal and war as abnormal" (144, pp. 41, 25).

[46] The concept of what geography is or ought to be varies greatly from country to country and also within countries. In some, like the Soviet Union, it is officially considered a physical science (although dissenting views are sometimes put forward). In America, geography is straddling the physical and social sciences, but

even tried to define their field (but seem to be not the worse for that). It would be premature because, ultimately, geopolitics is what geopoliticians do, and in the last decade and a half they have not done much. While political geographers have lately, especially in the United States, forged ahead and expanded their field of interest and study, the political scientists have not only not met them halfway but, on the contrary, and exceptions not withstanding, rather retreated and turned their backs to geopolitics. This is due partly to the notoriety earned by the German *Geopolitik* and partly to the success of—one could almost say the *appropriation* of the entire field by—political geography.[47] It is due, too, to a certain attitude of some geographers. "It can hardly be denied that many geographers have regarded as trespassers those students in other fields who presumed to study relationships between man and nature" (40, p. 125). Yet there is an awareness among political geographers that they are often obliged to operate with or search for certain new political concepts and ideas—a task for which, they admit, their training has not prepared them adequately (65, p. 196; cf. 40, p. 176).

A tentative working definition of geopolitics may, nevertheless, be useful for the sake of discussion: Geopolitics is the study of political phenomena (1) in their spatial relationship and (2) in their relationship with, dependence upon, and influence on, earth as well as on all those cultural factors which constitute the subject matter of human geography (anthropogeography) broadly defined. In other words, geopolitics is what the word itself suggests etymologically: geographical politics, that is, politics and *not* geography—politics geographically interpreted or analyzed for its geographical content. Being an intermediary (or subsidiary) science, it has no independent field of study but one that is defined in terms of the fields of geography and political science and their mutual interrelation.[48]

Geopolitics cannot be limited to the study of the political aspects or conse-

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it leans more toward the latter. In general, the field of study of geography is greatly influenced by the stage of economic development of the given country and by the problems this economic development both faces and creates. Geography is responsive to the demands of governments and societies, which, in their turn, respond to the geographical conditions under which they live. Consequently, one geographer speaks of "the relation between geographical thought and geographical environment" (183, p. 194); another, of "the influence of the natural environment on the development of the science of geography" (40, p. 308; cf. 133, pp. 198–99).

[47] Whereas three decades ago a political scientist, Harold H. Sprout, believed political geography to be a political science field (137), today the reverse is rather true; geographers tend to consider all studies relating geography and politics, however they may be called, as within their proper sphere of investigation.

[48] Some geographers have expressed doubts whether geography itself can rightfully claim a field of study of its own and have thought of geography as a science studying relationships and/or distribution of phenomena the nature of which is the subject matter of many different sciences, that is, that everything can be studied geographically but that there is nothing which geography can consider its proper subject matter. The chorological (or spatial) school of thought is quite influential in discussions on methodology of geography. The chorologists consider that those who insist that geography is a science investigating the nature of a well-defined subject matter (the geographical area and region) necessarily limit drastically the field of geography and disregard the fact that this is precisely not what many, or even most, geographers do. There is on this subject a polemical but exceptionally enlightening article, worth reading by anyone interested in methodology of geography, in which a Soviet geographer speaks articulately against the concept of geography as a chorological science (120).

quences of the man-earth relationship, because this would indicate that the "geo" stands rather for geology, or some nineteenth-century geography, instead of modern geography, which is, at least as conceived in this country, a science concerned more particularly with problems of "natural" or functional area differentiations and spatial distribution and relationship of different phenomena, mostly cultural in character; thus it is concerned with problems often only remotely related to the earth. But this does not mean that the earth can be treated merely as the stage of political activities; on the contrary, geopolitics must be both spatial and environmental. Industrialization, "man's mastery over nature," and the advent of the "air age" have quite naturally stimulated new geographical and geopolitical thinking. Yet, in this writer's opinion, we cannot but consider environment as more important than space both in the *selection of policies* in which geopsychical factors, especially as rooted in the historical heritage, are always at work and in the *execution of policies* for which it supplies the necessary power means.

Moreover, considering the problem of the selection of policies—of the way in which policies are formulated for and by the given sociopolitical unit—we must remember that every political philosophy contains some kind of philosophical concept of the proper man-nature relationship which, however deviously and remotely, always influences the values of the society and hence also the daily political decisions.[49] At the same time the system of values and priorities, the intellectual mood prevalent within a country and society, is in its turn influenced, in one or another way, by what Berdyaev called "spiritual geography" (5, p. 2)—by those intangible sociocultural-political effects of the long historical experience of intimate contact between the given people and its physical geographical environment. Consequently, the *operational scheme for the study of geopolitics* may be stated as follows: When studying the geopolitics of, say, Ruritania, we must pursue two themes: one, the investigation of the *objective impact* of Ruritania's "natural" environment on Ruritanian politics—of the actual physical limitations and opportunities with which the "natural" environment and spatial relationships confront any Ruritanian government; and, two, the investigation of the *subjective impact* of Ruritania's geography on Ruri-

[49] Because this writer considers that geopolitics is relevant not only to the problem of *execution* but also to that of *selection* of policies, he cannot agree with the suggestion put forward by the Hartshorne Committee (65, p. 176) that we substitute the term "power analysis" for that of "geopolitics." Power analysis is concerned with the problem of means in terms of known goals; that is, it is relevant to the second and lower level of politics, that of execution of policies. The first, higher, level of politics is that of primary policy choice. This choice may, of course, be modified according to the available means, but both logically and practically the choosing of ends precedes the very concept of means. The fundamental policy choices (as distinguished from derivative ones) are not made in view of the power analysis, but the power analysis is made with view of those choices. This is so unless we accept an extreme variety of Hobbesian mechanistic and sensationalist "philosophy" and consider (as Spykman seems to have) that we do not, in fact, have a moral nature and that our behavior is predetermined; what is considered a moral decision is, in reality, determined by our instincts and drives, in particular an irrepressible desire for power and domination (the *libido dominandi*). But this kind of "philosophy" is incapable of explaining certain traditions of asceticism, self-denial, and sacrifice—self-sacrifice sometimes to the point of overcoming even the instinct of physical self-preservation. See the discussion of the moral and instinctive nature of men in Kristof (82, pp. 599–601).

tanian politics—of the prism through which the Ruritanians view their "natural" environment and setting and, conversely, of the "geographical prism" through which the Ruritanians view the world at large and form their Weltanschauung.

In this context it must be pointed out that there is not any fundamental difference, either in method or in the field of study, between geopolitics and political geography—at least not insofar as political geography is understood and practiced today in America and in most of the West.[50] To repeat the old cliché that political geography is a static and geopolitics a dynamic science, that the latter but not the former engages in prognostication, or that geopolitics is an applied political geography would simply be to ignore the developments and trends in political geography of the last thirty years. Somewhat out of date, too, is Kjellén's assertion, made at the turn of the century, that political geography studies "the influence of man on natural environment," while geopolitics attempts to study the opposite, namely, "the influence of the natural environment on man," which subject belongs "to the sciences concerned with man, to psychology, ethnography, or to the political and social sciences," and "in this way Ratzel's political geography as also the main part of his anthropogeography are transferred from the field of geography into that of politics [and studied qua geopolitics]" (78, p. 17). Not even the distinction between (political) geographers as students of (political) regions and political scientists as students of processes holds true today.[51] There are already geographers who clamor for a "geography as the science of regional process-patterns of dynamic spatial relations."[52]

The only real difference between political geography and geopolitics is in emphasis—in the focus of attention.[53] Political geography qua geography tends to focus its attention on the geographical phenomena; it gives a political interpretation and studies the political aspects of geographic phenomena. Geopolitics qua politics, on the contrary, tends to focus on the political phenomena and attempts to give a geographical interpretation and study the geographical aspects of these phenomena. But,

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[50] "There have been attempts made to separate methodologically the subjects of political geography and geopolitics. But these attempts were not, and could not have been successful. . . . A large part of that which is treated in Germany under the heading of political geography and geopolitics is very often studied in England, France and North America, too, but under different names [e.g., human geography, social geography, economic geography, or under the collective name of social science and political science]" (43, pp. 18, 19, 21).

[51] Hartshorne (40, p. 176) has attempted to distinguish between historical and geographical studies by pointing out that Frederick J. Turner described himself "not as a student of a region, but of a process."

[52] Indicative of the direction in which we may expect American political geography to move is the following statement by Platt: "The nearest approach to a dynamic type [of concept in regional geography] is the 'nodal region,' and even this, as named and defined [in *American Geography, Inventory and Prospect*], is a static substitute for more dynamic forms: a node as a small area of concentration in a large area of dispersion instead of a focal point in a process-pattern of lines and limits of movement" (111, p. 190).

[53] Cf. Hettner (53, pp. 334–35). Hartshorne (40, pp. 175–76) discusses the problem of "geography in history" and points out that in studies dealing with this topic "the focus of attention is not on geography but on history—it is the phenomena of history which are studied in terms of their geographic aspects. . . . Probably most geographers would now agree that the geographic interpretation of history is logically a part of history."

in view of the latest interests and methods developed among American political geographers, even this distinction may not, perhaps, be entirely justified. Indeed, we can say that, in America, political geography and geopolitics merge.

American Geopolitical Writings

To relate the origins and development of geopolitics in America would require a separate study. But this paper would be incomplete without at least a sketch of the major sources and trends of American geopolitical thought and a few basic bibliographical data to guide those wishing to pursue the subject further. Besides, what is said below about the different origins and branches of American geopolitics is, to a large extent, true also of geopolitics in other countries.

We can roughly distinguish *three types of writings* which have been contributing to the fund and/or influencing the development of American geopolitics: *strategical, environmental-historical,* and *political geographical.* Each of them has not been concerned primarily or consciously with geopolitics per se but, rather, has focused its attention on certain very specific problems, or problems gravitating toward other than political science disciplines. The diverse geopolitical material and ideas they have treated and gathered has never been examined systematically, and integrated methodologically (insofar as it is possible), and for this reason it is not entirely correct to speak of an American school of geopolitics.

Of the three, the *strategical writings* are the most easily identified as politics, although only one specific kind of politics, namely, current foreign affairs and especially the so-called power politics. Hence the association, sometimes identification, in the popular mind of geopolitics with geostrategy and with war or, worse, with preparation for and even plotting of wars. The strategical writings are also the oldest influence on, perhaps the very beginning of, American geopolitics, but they are, too, the most erratic of all the geopolitical writings. Their genesis must be sought in the ideology of the "New Manifest Destiny"—above all, in the works of Admiral Alfred Thayer Mahan (93). Homer Lea (89, 90), General William ("Billy") Mitchell,[54] Nicholas Spykman (144, 145), George T. Renner (108, 116, 117), and Alexander P. de Seversky (127, 128) can be said to be continuators of this branch of American geopolitics, even if some of them may owe more to *Geopolitik* than to Mahan. Like Mahan, they all plead for specific policies and strategies which they consider imperative given the geographical factors and certain developments in international politics and military technology (24).

Harold H. Sprout, another student of Mahan and naval power and the only American political scientist to show consistent interest in geopolitical problems, also views geographical factors primarily in terms of their impact on the power capabilities of states in the international scene.

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[54] General Mitchell, the untiring crusader on behalf of the Air Force, believed, like Homer Lea, that world domination could be achieved by that power which would capture the strategic points giving control of the Pacific. The Pacific was for General Mitchell the "Heartland"—"he who rules Alaska will rule the world," he said. Like Lea, too, he predicted that the Japanese would attack America and said, in 1936, that the Japanese "will not politely declare war" but strike at Pearl Harbor "on a fine, quiet Sunday morning." Also like Lea, he considered preposterous the idea that peace can be brought about by arbitration; peace will be brought about "not by arbitration but by aviation." However, it must be pointed out, General Mitchell was not an imperialist and did not advocate the rule of force or an elite (30, 91, 104, 105, 165).

But his approach is, in distinction from that of most geostrategists, analytical and more general in nature (138–43).

Sir Halford J. Mackinder's American followers fall somewhere between the strategists and the environmental historians. Some of Mackinder's (92) and his students' writings are, like those of Mahan, concerned rather with grand strategy in the empire-building tradition. Others are more environmental-historical, although problems of global politics remain in the foreground.[55] The writings of Vilhjalmur Stefansson also belong to this intermediate type of geopolitics. In a sense they are expansionist and show an interest in grand strategy. But Stefansson is far from being an imperialist of the Mahan school. Neither is he really an environmental historian interested in some theory of human development; he is, above all, a crusader on behalf of the northlands. But it is difficult to believe that the political, economic, or strategic arguments he puts forward for a "northward course of empire," however valid they may be in themselves, are really his motivating force. Ultimately, it is his love of the "friendly Arctic"—a love of nature in the tradition of a Thoreau or John Muir—that stimulates him into becoming an explorer, geographer, historian, and geopolitician (147–52).

In general, the difference between the strategical and environmental-historical geopolitics is that in the former the relation between the geographical factors and politics is relatively more direct. The element of space, the distribution of raw materials and populations, strategic routes, and other similar factors of national power potential and military strength are taken into consideration and evaluated in terms of certain known political objectives. Thus the "geo" factors are viewed as external to the political aim itself; they are viewed as distinct and identifiable factors and are weighted objectively for their capacity of either facilitating or hindering the realization of the given policy.

In the environmental-historical geopolitics it is much more difficult to separate the geographical factor. It studies the impress of the physical geographical environment not so much for its day-to-day impact on politics as for its long-range and indirect effects. Since the answer to this question depends on the evaluation of certain imponderable and intangible factors, this kind of geopolitics is necessarily more dependent on hypotheses, concepts of human nature, and personal interpretations, as well as theories of history and politics.

The first important stimulus toward an *environmental-historical* interpretation of politics came in America from the writings of a historian and of a geographer, Frederick Jackson Turner[56] and Ellen Churchill Semple (125, 126). The latter, a pupil of Ratzel, is today all but forgotten. American geographers seem to treat her like an ancestor who, though buried in the family crypt behind a marble slab with gold lettering, is better not mentioned for fear the memory of past sins—perhaps one's own guilty conscience about an extant dusty copy of a thesis written years back on some "influences"—should be brought back to light. Turner's thesis is, on the contrary, still the source of inspiration for many geo-

[55] The most noteworthy examples of American criticism, and reinterpretation, of Mackinder's theory of heartland are studies by H. W. Weigert (174) and D. W. Meinig (101).

[56] Recently, a Norwegian scholar, Per Sveaas Andersen, published an interesting study (3) on the genesis of Turner's idea of the frontier as a decisive cultural-political factor, emphasizing the role which Turner attributed to the environment in shaping the lives of men under frontier conditions.

political interpretations and reinterpretations of America's (but not only America's) past and present. It permits a combination of spatial and environmental geopolitics. James C. Malin has applied Turner's discussion of open versus closed space environment to our present problems of global politics in the air age (94).

Perhaps the best known among American scholars of the environmental-historical school is Ellsworth Huntington (58–62). His influence extends over almost half a century. But, though still highly esteemed by some, his writings are likely to fall into oblivion almost as quickly as those of Semple. There is in them too much which, rightly or wrongly, reminds one of Henry T. Buckle (14), L. Metchnikoff (100), or even Montesquieu (106), to make their arguments palatable today. Then, much of Huntington's hypothesis runs counter to the values and philosophies cherished today in both the West and the East, and they are so broad, even sweeping, in character that it is exceedingly difficult to subject them to a systematic and scientific inquiry leading to either proof or disproof. In this latter respect there is, indeed, much similarity between the works of Huntington and Arnold J. Toynbee (135).

Somewhat similar in character, but not in interpretation, are the writings of Karl A. Wittfogel.[57] While Huntington is more of a geographer-historian who observes, in the context of broad historical developments, the relation between environment (particularly climate) and human ecology and biology, Wittfogel is rather an economist–political scientist who turns to geography and history in search of an explanation of the growth and spread of certain political-administrative systems of government. Essentially, what Wittfogel does is to apply his vast store of knowledge to develop critically ideas he found in Hegel and Marx. Since the problems he tackles are as complex as those confronting Huntington and Toynbee, it is not surprising that his conclusions, though well documented, are occasionally challenged (162, 129).

Finally, we must mention here Owen Lattimore, who is, perhaps, the most important among the contemporary Americans contributing to the environmental-historical type of geopolitical writing (83–87). His scholarship, though broad in scope, is not devoted to grand-scale hypotheses. Limited to a smaller geographical area–primarily Mongolia and its borderlands–it offers not only brilliant historical interpretations of the developments along China's northern frontier but also much food for thought which can be applied to other times and areas. There is much a historian and political scientist can learn from Lattimore.[58] The study of the stability and movement of cultural-political frontiers in terms of the existing environmental-economic conditions could be fruitfully applied to many areas, especially the underdeveloped and politically not yet organized areas (e.g., black Africa) where old historical patterns of integration are either weak or rapidly melting away under the impact of new centripetal

[57] The most recent work by Wittfogel of interest to geopoliticians is *Oriental Despotism* (182), in which he modifies his earlier views on the role of the natural environment in sociopolitical developments.

[58] Lattimore admits that in his early years (up to about 1930) he accepted Huntington's theory of "climatic pulsations" as a very important, even decisive, historical factor, but later the study of Chinese and Mongol history, as well as firsthand acquaintance with nomadic life in Mongolia, prompted him to reject the teachings of Huntington (85, p. xlix). Huntington's theory has been taken up and elaborated by Toynbee (161, III, 395–454).

forces generated in centers of swift regional economic growth made possible by local natural resources currently in great demand.[59]

The *political geographical* branch of American geopolitics can be said to be a marginal product of the American school of political geography which, as distinguished from the American school of anthropogeography, traces its beginnings to the time of America's participation in World War I and the subsequent peace conferences during which geographers served as official government advisers and, in the process, became much more aware of the relation between their field of study and politics in general and, especially, of the role geographical knowledge can and should play in the context of both practical statesmanship and political education.[60] Since this original challenge of politics to American geographers was in terms of international relations, political geography in America developed initially primarily as a counterpart, or annex, of "politics among the states"—as a kind of "geography among the states." While physical geography studied comparatively the so-called natural regions, political geography specialized in comparative studies of politically defined areas as delimited by the sovereignty of the several states.

But, quite soon, the focus of attention shifted away from the external, and often rather legal, problems of interstate politics (e.g., boundary disputes which were studied jointly by specialists in international law and geographers). Not unlike political scientists who substituted "politics among the states" with "politics among the nations" and turned to studies in depth of the conditions and motivations of international relations, geographers ceased to look at the state as a politically (though not necessarily culturally) homogeneous area and began to analyze, and map, the component elements of state power and also the complex ideological and economic forces which interact within and overlap the state boundaries. Thus, in a sense, American political geography began as a modified regional geography in which the objects of study were the areal relationships and differentiations of the sovereign political units, but, later on, combining the regional with the systematic approach, it climbed down the hierarchy of political phenomena from the top level to the more primary and elementary ones and began to analyze certain particular, and politically relevant, geographical aspects, elements, and characteristics of the state and its territory (10, 18, 42, 175, 176).

However, since this rather morphological approach tended to provide rather a multitude of data than an integrated body of knowledge, the present tendency in American political geography is to concentrate its attention on the sources of political energy—on the nodal elements of political activity, both intellectual and material (64, 65). In other words, American political geography became much more political (without necessarily becoming less geographical); as geography in general became more and more anthropocentric, political geography

[59] The desire and pressure for a quick rise in power and prestige based on acquisition of material goods is in some underdeveloped areas so overwhelming that the emergence of new centers of loyalties and cultures may be decisively influenced by the distribution of relatively easily accessible and marketable natural wealth.

[60] The most important work in political geography dating from this era is I. Bowman's *The New World: Problems in Political Geography* (first published in 1921), which, together with James Fairgrieve's *Geography and World Power* (first published in 1915), has influenced a whole generation of political geographers not only in America but elsewhere.

became more and more *Homo politicus* centered. While originally it was political only to the extent that it was adding, and relating, some political elements to physical geography, now it begins with the focus of attention on phenomena around which political activity tends to cluster and from which it tends to radiate and proceeds then to study geographically this activity in terms of both functional performance and movement in space. Thus the content and purpose of such a study is geography, but the point of reference, and the object of investigation, is taken from the domain of politics.

Quite correctly, American political geographers do not treat their subject as if composed of two entirely separate bodies of phenomena—political and geographical—which may or may not relate. Political geography (and geopolitics) studies Janus-like phenomena; one face is political, one geographical, and, since the second can be studied and understood only in terms of the first, the logical procedure is first to examine the features of the political face and then only to turn to its geography.

Thus American political geography is today closer to geopolitics than at any other time; indeed, it has skilfully assimilated much of it. Its emphasis on movement, process, and dynamics emphasizes how much American geographers have adapted to their needs that which made German geopolitics of three decades ago seem comparatively new and modern. The concept of "focal point in a process-pattern" introduced by Platt (111, p. 190) reminds one of the "geopolitical manometers" the Germans used to study the movements and shifting patterns of development of political, economic, population and other centers of growth, and pressure within a state or on the international scene. The concept of the state idea as a nodal element in terms of which states should be studied was first introduced by Ratzel and constitutes today the core of Hartshorne's theory of functional approach in political geography (39).[61] Recently, it has been suggested that this theory and Ratzel's laws of the territorial growth of states "have parallel ideas" and "differ very little" (58).

The most notable effort to bring geography and politics, geographical concepts and political concepts, closer together has been made by Stephen B. Jones. He states that he has been "unable to split the hair that separates political geography from what might be called geographical politics" and insists that there must be a continuum from geography to politics; "our aim is to pull political science and geography together, not to separate them" (70, pp. 112 ff.). Jones's unified field theory of political geography "tells students of geography and politics what (in very general terms) they need to learn from each other, what each has to add, but not how each fences himself off." Its "idea-to-area chain" ("Political Idea–Decision–Movement–Field–Political Area") is "visualized as a chain of lakes or basins, not an iron chain of separate links. The basins interconnect at one level, so that whatever enters one will spread to all the others." It thus is possible to trace the motions not only of the centripetal or centrifugal forces originating with certain fundamental loyalties (e.g., those generated by the state idea) but also the chain of reactions set off by any political idea which is followed by a decision and movement, hence a "circulation field" with effects in some area. Moreover, it takes account of both the flow from the idea to the area, "essentially a process of controlling or creat-

[61] Hartshorne repudiates his definition of, and approach to, political geography as presented fifteen years before (42).

ing," and the reverse, which "is more correctly described as conditioning." Consequently, Jones's theory should be acceptable to both the extreme voluntarists (like Emrys Jones) and the "neo-determinists" (like O. H. K. Spate) or "Stop-and-Go Determinists" (like G. Taylor). Since Jones sees the idea-area chain not as a one-way but a two-way street, the problem of what causes what, when, and how remains open to analysis and discussion in every particular case. Finally, the unified field theory has, too, the advantage of bypassing not only the hump which usually separates political science from the geographical sciences but also the smaller humps which tend so often to segregate physical from human geography or environmental from spatial geopolitics.

Before closing this part of our study, we must mention still another branch of geopolitical writing—that concerned with problems of frontiers and boundaries (1). Only two important books have been published in America on this subject, one by S. Whittemore Boggs (9) and one by Stephen B. Jones (68). Both deal exclusively with boundaries, not frontiers, and are indispensable introductory reading for political scientists interested in boundary problems and bibliography dealing with case studies of boundary disputes. Students of international relations will find of interest some more recent studies by Eric Fischer (27, 28), G. Etzel Pearcy (107), and Stephen B. Jones (67, 69, 71); this writer has contributed a theoretical discussion of the nature of frontiers and boundaries (81).

In general, we must observe that the study of boundary problems, once a major field in political science, has been today almost entirely taken over by political geographers. This, as well as other similar "encroachments" by geographers on the domain previously claimed by political science, would be very welcome if it did not go hand in hand with a retreat on the part of the latter. But, of course, geographers cannot be blamed for that. It is up to political scientists to stand their ground and thus facilitate closer contacts and understanding between the geographical and political sciences.

Conclusions

The premodern geopolitical writings are not exactly geopolitical in our sense of the word, because the distinction between the world of man and the world of nature is blurred. Everything, including man, is an integral part of nature, and all science is philosophy, that is, quest for knowledge about the whole. The activities of man are one of the many manifestations of nature. Man, and his thoughts and politics, cannot be detached from nature; they are the necessary effects of natural causes. "The laws of nature . . . replace for Montesquieu the wisdom of man. . . . *Man . . . is regarded as a part of nature*, and the explanation of historical events is sought in the facts of the natural world. History so conceived would become a kind of natural history of man" (19, pp. 78–79). (Italics mine.) There is no genuine give and take between man and nature, as between two independent entities, because, strictly speaking, man is more than nature directed; man and nature are one.[62] Therefore, geopolitics as a science

[62] P. Vidal de la Blache calls this conception of oneness of man with nature "la conception de l'unité terrestre" (166, p. 5). This idea has strong roots in Chinese and Japanese thought. It is interesting to note that in Communist thought, despite all its emphasis on "conquest of nature," the "conception de l'unité terrestre" is, essentially, accepted too. Soviet writers speak "o materialnom edinstve mira" ("about the material unity of the world") (34, p. 29). And since Marxist theory denies the existence of any realm —spiritual or intellectual—which does not, ulti-

of the relationship between the free political creations of man and man's physical geographical environment cannot exist.

This cosmological conception of man within nature went through a slow evolution. A century and a half ago geographers still did not always distinguish between the social and non-human environment; man and animals were seen as forming one environment. (Kant's *Physische Geographie* includes both anthropology and zoölogy.) But then, with urbanization, industrialization, and the emergence of sociology—with the growth of man's confidence in his own powers and the resulting anthropocentrism—man and his non-human environment came to be treated as entirely separate elements. Welcome as this separation was, it led to an underestimate of the persisting interrelationship. Geopolitics, as well as political geography, attempts to show that man, and in particular political man, and environment, being separate and discrete, do, nevertheless, interrelate and continuously interact.

The twentieth-century scholars who came into the field of geopolitics have, in general, been animated by two ideas: (*a*) to free political science from legalism and the overwhelming influence of historicism (and historical determinism of both the materialistic and non-materialistic variety) and (*b*) to give to politics a solid empirical base.[63]

The first idea is essentially sound. We political scientists have emphasized history perhaps too much in our education, but we have failed to learn from the historians to relate man to his natural setting. Geopolitics should investigate the relationship between politics and the geographcial environment in the same way as the relation between history and geography has long been studied.[64]

The soundness of the second idea seems debatable. First, can political science be a primarily empirical science; that is, is it cor-

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mately, owe its origin to the material base in nature, man is, in Communist conception, not only metaphorically, or merely in some aspects, from the earth ("for dust thou art, and unto dust shalt thou return"). He is totally of the earth and an integral part of it: the earth came partially—in the botanical, zoölogical and human species—to life, and mankind plays in its relationship to the (rest of the) earth a similar role to that which the Communist party plays in relationship to humanity at large. It is the conscious and most evolved part of the world, and, as such, it has the right and duty to mold, transform, and better the passive and unthinking elements of the world. Thus, although wholly *of* the earth, man is not determined *by* the earth. On the contrary, it is he who conquers the earth, and he is determined only by that which permits him to make this conquest, namely, labor: the social relationships of production.

[63] Hettner (52, p. 160) complained: "Only history, and not geography, was considered as the scientific base of politics." A similar complaint was registered by the American educator E. Schnitzer (122, p. 508): "In the past their [the politicians' and state officers'] professional training has been predominantly along legal and historical lines; in the future geographical study should take a more prominent place in the course of their education." See similar statements by K. Haushofer (46) and Kjellén (80). Kjellén writes: "This book represents a substantial step forward toward the goal which this author, as a man of science, has been pursuing—with steadily increasing purposefulness—for two decades now: a *System of Politics* based on a purely empirical concept of the state."

[64] Ratzel (113, pp. 229–30) cites Turner's study on *The Significance of the Frontier in American History* as an example of sound understanding of the relation between history and natural environment. Of course, contemporary geopolitics cannot limit its interest to the so-called natural environment; it must study politics in its relationship to the totality of the complex factors investigated by modern geography: historical and economic geography, human and physical geography, regional and spatial (or systematic) geography.

rect to strive, as Kjellén did, after "a System of Politics based on a purely empirical concept of the state"? Second, if we do accept the necessity of an empirical base for political science, should we then choose, as Sprout once suggested (137, p. 440), "regional geography as the 'bed rock' upon which political science is founded"?

The first question is controversial and has been answered by social scientists with a variety of shadings of "Yes" and "Nay." All political scientists who are devoted to the strictly empirical school, yet are not geopoliticians, spend their efforts in statistical, psychological and other observational research. Essentially, what they hope to discover is not the merely political laws of behavior but laws of human behavior in general. Their approach will stand or fall together with the empirical school of the social sciences as a whole.

Geopoliticians do not construct their thesis as embracing the totality of human affairs. Their point of view is that geographical factors and politics combine and conspire together for the creation of certain principles of sound politics. But this implies that we have first to answer the question: What are sound politics? We have to realize that geopolitics is not a nautral science, not even in the same sense as anthropogeography can be considered a natural science. In this writer's opinion, geopolitics, being a branch of politics, partakes of the moral sciences.[65] As Rousseau said, "Those who would treat politics and morality separately will never understand anything of either" (118, p. 269). We investigate what we ought to do in order to establish a good *polis*. Geopolitics cannot be the "bedrock" of politics because it itself is animated by a political-philosophical base. It is the human will and reason, and their choices, which underlie both politics and geopolitics. A certain geographical or geopolitical situation may be very important, but still more important is how we *conceive* that situation. In the words of a prominent historian:

> The fact that certain people live, for example, on an island has in itself no effect on their history; what has an effect is the way they conceive that insular position; whether for example they regard the sea as a barrier or as a highway to traffic. Had it been otherwise, their insular position, being a constant fact [being the "geopolitical bed rock" of politics], would have produced a constant effect on their historical life; whereas it will produce one effect if they have not mastered the art of navigation, a different effect if they have mastered it better than their neighbors, a third if they have mastered it worse than their neighbors, and a fourth if everyone uses aeroplanes [19, p. 200].[66]

[65] E. A. Walsh's main criticism of Haushofer's geopolitics was that it was divorced from moral philosophy. *Geopolitik* thus became "the politics of a wholly earthly conception of life. It is the logical culmination of a process of secularization both of mind and cultural institutions . . . [of] the scientific trend . . . in the direction of emancipating thought from moral obligation and spiritual control" (170, p. 109). A geographer, G. Taylor, has expressed an opposite view. He reverses the whole problem: the question is not how to use for moral goals certain objective geographic data but how to derive moral solutions from a scientific study of the environment. Since there is a "world plan" laid down by nature, we can "attempt to base the teachings of freedom and humanity upon real geographical deductions" (156, p. 606). Needless to say, few students of political philosophy would agree with the way Taylor puts the problem of morality in politics. But this should not disturb him. He has foreseen it. "I do not think that my ideas on *Geopacifics* (p. 606) will receive the attention they deserve much before 1976" (157, p. vi).

[66] The coast of both Norway and Chile is long and indented, yet the Chileans never became the American Vikings. "The Phoenicians, the Greeks, and the Romans conceived the Mediterranean as an element which connected them with other people, but the Aztecs have conceived of their Mediterranean—the Caribbean

The geopolitical situation may condition some of our ideas and values, yet it can never be a "bedrock"; it is only a "raw material" which our conception of politics and of the good life may, or may not, find useful. It is only after we have recognized our moral-political conception of life that the use of geopolitical "raw material" becomes imperative. The geographical location and nature of our country influence our political perspective, but they do so in a rather static way. Compulsion to action comes only after this perspective has been deepened and reflected in the mirror of our ideas and beliefs (cf. 113, p. 247).

Geopolitics suffers from two weaknesses. One is dichotomy. Dichotomy is the stress on *Erdgebundenheit* and on human will at one and the same time. It can be solved only if we accept, on the one hand, the unavoidable permanency of our relation with the earth and yet, on the other hand, remember that we have today the power to change the environment to which we are tied. It would be a mistake to become impatient with the contradictions which beset geopolitics, as well as other social sciences, and reject it, and the insights it offers, altogether. The extraordinary complexity of geopolitical problems involves many risks for the researcher who tries to disentangle them, but this should be a challenge to the scholar, not an excuse for shying away. "Between the ruthless simplicity of determinism and the shamefaced admission of impotence there remains only a narrow path for the reasoned approach" (109, p. vi). Remembering that *facts* should not be too readily identified with *causes* and that certain essential *conditions* for a process are by no means necessarily its *guiding forces*, we have to strive for a meaningful interpretation of the interplay of the political and moral will with the environmental limitations and opportunities. And we cannot be satisfied with a static interpretation. The relationship between man and the natural environment is subject to constant evolution, because both man and environment change. The task of geopolitics is to keep abreast of all the political implications of this ever changing relationship.

The second inherent weakness of geopolitics is that it can be used effectively, because inconspicuously, by propagandists. Maps drawn in the service of a given ideology can always tell certain things and conceal many others. (True, economic statistics and diagrams can be no less deceptive.) But the propaganda value of a leaflet or poster full of statistics and diagrams is nil; it is neither eye-catching nor easy to understand or remember. A poster with a true or pseudo-geopolitical map is, on the contrary, attractive and seems to tell merely a self-evident truth. Men have already learned to distrust words and figures, but they have not yet learned to distrust maps.

The only weapon against propaganda-geopolitics is geopolitical education. The more we study and teach about geopolitical problems, the less will be the danger of geopolitics as propaganda, and the greater the chance for geopolitics as a science. But we should have no illusions that geopoliitcs can supply us with the kind of objective truth which would save us the trouble of making moral and political choices. Geopolitics will always be a subjective science (cf. 44, p. 356), more exactly, a science animated by, and in the service of, a philosophical truth. Modern geopolitics, like politics, is not tied to any specific ideology, but, in con-

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Sea—as an element which separated them from other people. The Khazars, at home for centuries along the shores of the Caspian and Black Seas, have seldom ventured on either of them; the Varangians, newcomers in the same country, in a short time built a large fleet" (82, pp. 603–4).

trast to the geopolitics of Aristotle and Bodin, it is never neutral; it is always influenced and guided by some kind of political philosophy and a Weltanschauung which includes a concept of the proper man-nature relationship.

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Political geography in the modern world[1]

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I. *Political Geography as a Part of Geography*

Political geography is an integral part of geography, focused on the earth, in contrast to political science, which I presume to be focused on the institutions of government. Political geography has many ramifications with political science, but its focus of interest differs (3). Geography studies the variation in character of areas of the earth resulting from the combinations and interconnections of features of many kinds, regardless of whether of natural or of human origin, which vary in part independently and in part in covariance with each other.

Intimately interwoven in the total complex of areal variations are variations of political characteristics. These have commanded the attention of geographers since the earliest development of the field, except for a period during the last century when the emphasis on physical sciences caused geography to be unbalanced in concentration on physical earth features. At the turn of the century, however, Friedrich Ratzel published his systematic study of the manner in which the extent and character of political areas was dependent on other characteristics of areas, including their physical features (1). More recent work has emphasized the reverse relationship: political forces, particularly those of government, produce areal variations in the characteristics of many other features, both economic and cultural, with sharp differentiation of areas as politically delimited. This latter relationship is increasingly significant as modern governments assert increasing control or influence over other human activities and as human activities exert increasing effects on the face of the earth.

II. *The Scope of Political Geography*

Political geography thus may be described as the study of the variation of political phenomena from place to place in interconnection with variations in other features of the earth as the home of man. Included in these political phenomena are features produced by political forces and the political ideas which generate those forces. The two are, of course, intimately interrelated, as Stephen Jones has pointed out (4). Following the link-chain analogy he proposed, political attitudes, views, or ideas may lead, through communication and controversy, to decisions. Decisions stimulate, or permit, certain movements of men, materials, and ideas within a more or less definite area. The area thus becomes a "field of interaction" of forces, to borrow a term from physics. To the degree to which this field of interaction extends over a particular

[1] Revised version of a paper read at the conference on "The Uses of Political Geography," Harvard University, July 29, 1957.

area of the earth, that area is defined as a political area. If a framework of control of political forces—that is, a government—is established, and to the extent to which it is established and made effective, an unorganized political area is converted into an organized political region—a region in the original sense of realm.

This resultant is of unique importance in geography. In no small part, the ultimate goal of geography is to provide scientific description of the way in which the originally unorganized areas of the earth are organized into various kinds of functioning regions.[2] The natural drainage of river systems provides a superficial form of organization of regions. Man, in his economic and social activities, produces certain very small unit areas, each intensively organized, such as farms or cities. He also produces over larger areas certain forms of functionally organized areas, generally partial in function, loosely organized, and overlapping in extent—for example, the trade area of a central city. But, of areas larger than a city, the most complete and precise forms of functioning units are those organized by the political forces of government.

Political forces other than those of government, perhaps in opposition to government, may produce a distinct political area but cannot organize it as a unit. Thus, throughout modern times, that part of Europe which includes Warsaw, Kraków, and Poznan, however divided among outside goverments, has constituted a distinct political area, not because it was Polish-speaking, but because its indigenous political forces continually insisted that it *should* be organized as a distinct political unit—Poland.

The relationship of area and idea, as Jones notes, functions also in reverse: once a political area has been set up, by whatever means, the forces within it produce a distinctive field of interaction which conditions communication and hence attitudes. The state itself tends to produce a distinctive set of attitudes throughout its area. Where regional attitudes are in sharp conflict with the existing state organization, there is often, as in Poland or Alsace-Lorraine before World War I, a heritage from a previous and different political organization of area. In other cases, however, as in Ireland or India under British rule, attitudes of opposition may produce a political area demanding organization as an independent unit without any such previous existence.

This statement of the field appears to provide little place for two kinds of study frequently associated with political geography: military geography and geopolitics. The former seems to me a separate subject, whether considered as a part of geography or of military science. "Geopolitics" is a term which has been used in many different ways and might be considered as "applied political geography." Often, geopolitics represents the application of the environmentalist dogma to the study of national power; at worst, it represents the use of all kinds of pseudo-scientific arguments for the promotion of nationalistic aggression. Its followers in Germany, few of whom had standing among their professional colleagues, failed to establish a distinct body of knowledge, whether of facts or of relationships, but excited public interest by statements of sweeping conclusions based on dogmatic generalizations which were not demonstrated and can readily be shown to be questionable if not clearly erroneous (6, 7). Under the slogan word "Geopolitics," however, these writers served to emphasize the elementary principle long recognized by

[2] Called "nodal regions" in the chapter on "The Regional Concept and the Regional Method" written by Whittlesey's Committee (11). The term "functionally organized region" is taken from the earlier studies of Robert S. Platt.

shrewd practitioners in international relations that evaluation of the relative power of states must include consideration of *where*—of the location of the state and its productive areas in relation to patterns of land and sea, of populated and barren lands, of routes, and of other organized or unorganized areas.

What then is involved in the political organization of areas? This question, as suggested earlier, has two aspects, or two opposite directions of interest. In the one, the interest is focused on the genesis, structure, and function of political areas as related to other features of areas; in the other, on the consequences for economic and cultural geography that result from the existence and functioning of political areas.

Most of the literature of the field has been concerned primarily with the former aspect and tends in many cases to focus on the functioning of political units not as areas but as political entities; the end purpose is therefore political rather than geographic. The late Professor Whittlesey was the first among American geographers to emphasize the consequences of political areas for geography (9). This view had been expressed also by several European geographers, and recently increasing research has been pointed in this direction.[3] From a practical viewpoint it might seem that the former aspect was obviously the most important for study. The greater the importance of the effects of political areas on the general development of areas, the more important it would appear to know what determines the phenomena of political areas. But this presumes that, given greater knowledge of what determines the nature and origin of political areas, man would be able to put that knowledge to practical use in designating political areas. One could as well argue that the study of basic factors that cause vulcanism and earthquakes was more important than the study of their effects. To what extent this analogy holds true had best be determined not by deduction but by examining the world as we find it.

In organizing a political area, at any level of subdivision, government finds it necessary to establish certain conditions for its own purposes which have consequences, beyond those purposes, in the geography of the area. The remainder of this paper is concerned with these conditions and their consequences: (1) it is necessary to determine and delimit precisely the extent of territory to be included in the organized area; (2) the territory must be subdivided into likewise disitnct political areas, at successively lower levels, with a uniform system of relationships both among them and to the over-all political area; (3) the naturally diverse and divergent parts of the area must be converted into a single functioning areal unit; (4) the area must attain the productive capacity needed for its functions as a political unit; and (5), on the basis of the previous conditions, political organization seeks to establish its area as a viable unit among other similar units of area.

The capacity of an area to meet the above requirements depends in part on its non-political features, including natural conditions, cultural characteristics, institutions, and material features of human construction. Conversely, the establishment of the conditions for political organization has important consequences for other human activities of the area, for its culture, and even for features of primarily natural origin, such as soils or water resources.

Adequate treatment of all levels of territorial units, including, say, American counties or New England "towns," would re-

[3] Especially by Hugo Hassinger (6, p. 16).

quire much too long a paper. Attention is therefore concentrated at the level of independent states.

III. *Determination of Extent of Territory*

The determination of the extent of area to be included in the territory of particular political units is no doubt the problem which has occupied the greatest attention of students of political geography. But these studies have not enabled us to construct general theories to explain the territorial growth or decline of states. The question arises whether we should expect to find such generalizations.

The extent of territory included under a single political organization is determined by a series of individual decisions, expressed in treaties or other basic laws. Each such decision is the resultant of opposing forces within and without the area. Since disputes over territories are seldom reconcilable to mutual advantage, the decision is generally appealed to higher authority—in the case of independent political areas, to the ultimate authority of armed force. Hence the history of territorial changes of states appears in total as a meaningless sequence resulting from repeated fluctuations in military power or personal leadership.

To extract some meaning out of this kaleidoscopic picture, various students have attempted to construct general theories of territorial growth, such as the theory of natural boundaries or the theory of geopolitics of the state as an organism, committed to territorial growth or decline. While these particular theories have been discredited, the fact that the territorial extent of many states has resulted from a process of historic accretion still tempts students to search for some principles of growth.

These appearances of growth were due, I suggest, to special conditions which were never universal and have largely disappeared. One was the peculiar nature of feudal states under which the over-all organization, though unable to control the territorial conflicts of subordinate units acting largely independently, was able to maintain certain principles which facilitated continued increase of stronger units. A second condition was the concept of personal sovereignty, made continuous through the institution of dynasty, under which political territory was a personal possession. A third condition was the existence of large areas lacking in political organization above the tribal unit situated adjacent to areas of increasingly strong political organization. With the discovery and exploration by Europeans of the rest of the world, almost all parts of the world became exposed to this situation. Finally, the interest and power capacity of individual states was geographically restricted to immediately adjacent areas and to particular areas elsewhere in the world. Small wars and resultant territorial conquests by minor states in remote areas could be safely tolerated. Outside of Europe there was no concert of the powers to restrict expansion.

These conditions varied greatly in the different theaters of the world and in different periods of history. All have been eliminated or are greatly altered today. Hence any generalizations that might be found to provide partial explanation for the territorial pattern of any one major part of the world, as developed in any one historical period, would not be applicable to other areas or for other periods, particularly not for the future.

Rather, I suggest that the existing extent of each political territory is the resultant of a unique set of forces operating in a more or less unique historical and geographic frame-

work. Further, most states today can anticipate little or no opportunity for territorial growth; in the great majority of cases each existing state must regard its present extent of territory, exclusive of colonial areas, as one of the fixed facts of its geography unlikely to change unless by major catastrophe.

Colonial areas, however, are obviously undergoing great changes. These have been mainly changes in status without changes in extent of area, except in such cases as the partition of India. In tropical Africa, however, colonial territories are of relatively recent origin and bear little relation to existing areas of cultural and tribal relationships (9, pp. 127–59). Here the development of independence may well lead to indigenous movements for redivision of territorial units. Union of separate political units into a new political unit is often discussed but seldom acted upon. With the disappearance of personal sovereignty, it is no longer possible to achieve this result by dynastic intermarriage and by the fortunes or misfortunes of royal reproduction. Voluntary unions of previously independent units are very rare. It may well be, however, that current developments in western Europe are heralding such a case. We will return to this topic.

IV. *Internal Subdivision of Territory*

Every organized political area must be subdivided into subordinate areas of organization. Even if this is intended only for convenience of an administration dominated from the center, the subdivisions tend, as the Soviet Union is learning, to become local fields of interaction of political forces demanding some degree of autonomy in governmental functions.

Since it is generally within the legal authority of the government of an over-all political area to determine the territorial extent of its subdivisions, this subject is often considered open to reconsideration or modification. In reality, it may be more difficult for a state to change the extent of its internal units than that of its total territory. In some cases the internal units of political areas may be older than the units of which they are parts. They may represent long evolutions as regions of local political unity, as, for example, in the case of the provinces of Austria, or they may be merely the consequences of momentary situations in the midst of a series of fluctuations which suddenly became fixed by incorporation into the larger, more stable unit of area, as was formerly true of the princely states of India. In other cases, where the expansion of political authority preceded or accompanied settlement or where drastic revolution made it politically possible to wipe the slate clean of previously established divisions, the system of subdivision may have been designed by the over-all authority, either according to some rational scheme adjusted to local conditions, as in the case of the departments of France established after the Revolution, or merely on a checkerboard pattern, as in parts of the United States and other newly settled countries.

Regardless of origin, to the extent that the subordinate areas have functioned as organized areas, they tend to become established political units increasingly resistant to change. In many countries it is obvious that the existing units are highly unsuitable, either in size or in particular extent for their functions, but the opposition of vested interests makes it almost impossible to alter the internal units, except in consequence of general revolution or complete dictatorship. Thus, over most of western Europe, Anglo-America, and the larger countries of Latin America, areas of the second level of subdivision, perhaps even of lower levels, have

shown *less* change since first established than have the political areas at the independent level.

However, if an established system is once broken down, as in West Germany after the catastrophe of the second World War, there follows an open season on territorial subdivisions which may become a major issue of internal politics. Because redetermination of internal political territories, once undertaken, is open to rational planning rather than dictated by force, it may well be that political geography can contribute far more to solution of problems at this level than at the level of independent states—but only where and when the opportunity is open.

V. *Organization of the Political Area into a Functioning Unit*

HOMOGENEITY

Whatever the basis on which a political territory has been determined, its government seeks to organize it into an area functioning as a unit. For this purpose it is necessary to establish certain elements of uniformity, of homogeneity, throughout an area which in itself is always somewhat variegated, and to integrate all its parts, however diverse or divergent, into a coherent whole.

What elements are essential in this process is difficult to determine by mere induction from what has happened. The organization of an area inevitably produces numerous elements of uniformity, not all of which may be essential for the purpose, but at the same time makes possible greater regional specialization in production, leading to increased diversity of its regions. Indeed, the very idea of organization introduces a major element of heterogeneity, for, if an area were previously completely homogeneous in all respects, to organize it into a unit area is to create differences in one of the most critical factors, namely, the relative location of its several parts to each other and to the whole area.

It may be helpful to consider types of situations in which states make no effort—or have no success—in integrating their territories into single units. With few exceptions, colonial powers have not attempted to integrate a state area with its overseas dependences. In part, no doubt, this is due simply to remote separation, but in most cases it also reflects recognition of marked cleavage in culture and economy.

Similar conditions, both as to social cleavage and as to lack of communication, may be found within the limits of a political territory which forms a continuous land area and appears as a single unit on the ordinary political map. This situation is true in very large degree of most of the states in tropical Latin America and Southeast Asia and of the states whose territories extend into subarctic and arctic regions. Even the appearance of coherence, because of physical contiguity, is misleading. Unorganized stretches of forests, tundra, mountains, or desert may impede communication and hence coherent organization even more than several thousand miles of open sea.

Whatever the official form of organization used in these countries, in actuality the areas of radically different culture and more primitive economy are not commonly handled as integral parts of the state area but rather are ruled from that area as overland colonies—indeed, in some cases there is no effective organization other than that of the local tribes.

These areas of internal colonial territories, it may be noted, are neither exceptional nor of small extent. For all but three of the independent Latin-American states, they constitute in each case over half the territory legally included under each state. The world over, including particularly the dense-

ly populated oases of Central Asia under colonial rule of the Soviet Union and China, such internal colonial areas number nearly as many people as the total of all areas officially recognized as colonial.

Somewhat different is the situation in which there is a great difference in culture and economic level but not necessarily a marked difference in degree of settlement and density of population. Official recognition of such contrasts reaches its maximum in the native reserve areas of the Union of South Africa. The Indian Republic has been organized in terms of two or more categories of units in an effort to recognize the notable differences between areas which were formerly British provinces, princely states, and tribal territories.

These cases suggest that one of the essential requirements for unity is homogeneity in social values, mores, and standards, including particularly those of economic and political relationships. In developing and maintaining the essential elements of homogeneity, common language, folklore, literature, or religion may well be significant, but in themselves they are neither necessary nor sufficient elements.

A more universal illustration is the problem resulting from the dichotomy between rural and urban societies within the same country. To the extent that this is not merely a contrast between occupations but a contrast in way of life, it may produce two opposing societies throughout the country. This contrast is most extreme in countries in the Middle East and the Far East, where the rural population has long been intrenched on the land and where contact with modern technology and ideas has been limited to the cities (8). This dichotomy may become even greater if the predominantly urban leadership in such states looks only to industry as the means of economic growth. In the United States, in contrast, the relative urbanization—not to say urbanity—of rural society reflects the importance of simultaneous, interwoven development of both rural and urban districts in economy, education, and communication.

Of most direct importance for political organization is a common set of values on matters related to government, including attitudes toward law and justice, and, particularly, agreement on the proper relation between the state and the citizen. That common language is not essential or sufficient in promoting this vital form of homogeneity is illustrated by differences between such attitudes in Great Britain and the United States or, even more strikingly, as between Germany and the German-speaking parts of Switzerland. Basic disagreement on the purpose of the state may lead to organized opposition to the constitutional foundations of the political organization of the area. Where such opposition reflects class cleavages extending throughout the area, as has been characteristic of modern France, it undoubtedly weakens political unity but without disrupting the coherence of the area, whereas organized regional opposition may disrupt or destroy the unity of the area.

In sum, homogeneity of the political area is essential for basic values and standards of what is proper and desirable in the relations of people with each other and with the over-all organization of the area—economic, social, and political. To the extent that the existing institutions of language or religion tend to produce uniform or divergent values and standards, they will be encouraged, left alone, or attacked in the efforts of the political society to organize its area. At the same time the political organization will utilize other institutions under its control, including particularly schools and military service, to establish the desired elements of uniformity.

COHERENCE

Whatever the similarities or differences among the several regions of a political area, its organization as a functioning unit requires the establishment of coherent relations among all parts.

A basic requirement is the provision of physical routes and facilities of communication and transport among the several regions and between each region and the physical center of organization—the capital. Modern technology has made it possible to overcome almost all physical barriers, but in many parts of the world the cost of construction is a prohibitive factor. This is still a major difficulty in many Latin-American states, including even many of the smaller ones, as in Central America. It may also present serious difficulties in political areas at a lower level, as, for example, in the state of Idaho.

A positive encouragement to political coherence is provided by economic integration based on regional diversification and exchange of products to the mutual advantage of all parts of the political area. But if the economy is focused on outside trade moving separately from different areas of the state, the regions are economically divergent. Consider the tendencies for disunity between northeastern and southeastern Brazil or, at a lower level of political units, the situation of New Jersey, once described as "the slave of two cities," both outside its domain. Self-sufficient regions, as in our southern Appalachians prior to the development of coal-mining, are nonparticipating in economic integration.

Economic integration tends to establish fairly even levels, even among regions which vary greatly in resources. Thus the differences in income per capita among the regions of the United States, though considerable, are much less than those among the independent states of western Europe. As government is increasingly called upon to regulate economic relationships, it may find it necessary to secure still greater uniformity, as, for example, in this country, in respect to laws governing minimum wages, workmen's compensation, etc.

Coherence is facilitated in many countries, as in France, Sweden, or Mexico, where the geographic pattern of economic and social integration of regions is focused on one dominant region. This is all the more true where the specific focus within that "core area" is a single city, commonly the capital. Where such a pattern has not resulted from past development, the political organization often endeavors to produce it by concentrating economic as well as political functions in and around the capital city, as in Germany after 1871 or today in Yugoslavia. But the pattern of concentration in a core area is neither a universal nor a necessary condition for coherence, as is demonstrated by the case of the United States or of Great Britain since the industrial revolution.

Under a highly centralized organization, a dominant core area whose major center becomes the "primate city" may be able to extend its own homogeneity and coherence throughout the entire area. It may, on the other hand, produce negative reaction and even conflict from the divergent regions. The question must also be raised whether such a system does not handicap the economic, social, and political developments of what in France are called the "provincial" areas of the state.

The alternative method is to seek more balanced development by division of power between the central authority and the subordinate political areas, whether on the basis of federalism or a similar system established by practice rather than constitutionally. This permits each part of the state

to determine its development to some degree on its own terms. While the result may appear less homogeneous and coherent, in reality both these elements may develop more strongly under this system, and the greater freedom of regional development may well result in greater economic and social strength.

Between these two forms there are, of course, many gradations and variations. The United Kingdom represents a particularly interesting combination in the special arrangements provided for differences in England, Wales, Scotland, and the Isle of Man and in the autonomous powers granted the cities and historic counties. In most European states, however, the internal organization provides relatively little power to subordinate units even where these represent notably heterogeneous regions.

It should be noted that organization of an area on a democratic basis may utilize any of the possible gradations, whereas a dictatorial system can operate only on a highly centralized basis. While the ability of a state to function under any system requires a certain minimum degree of homogeneity and coherence, if those conditions are lacking, a highly centralized organization may be able to maintain itself, even with little success, whereas a federal system may provide divergent forces with the political means for disruption of the state, as, for example, in this country in 1861.

A critical condition for coherence is continuous contiguity of the parts: if every region is strongly associated with all its neighbors, then even the peripheral regions, however remote from each other and from the center, may be effectively integrated in the area as a whole. But this contiguity, and the coherence of the area as a whole, is disrupted by the presence of any intervening portion which has little communication with its neighbors—whether because of lack of population, a low level of economy and culture, or marked differences in cultural or political attitudes. The most extreme disruption occurs where an intervening area is part of an outside state, especially if it is an unfriendly one (e.g., the problem of Pakistan).

Even if such interruptions are effectively overcome in economic exchange, the psychological separation tends to produce a cultural and political cleavage. Thus the sheer absence of population in the seas is the major reason why they have continued to function as strong dividing factors long after they ceased being barriers to transportation. Consider also the effect of tropical forest or mountain areas of sparse and primitive population in disruption of the unity of many Latin-American states, even within the limited portions of their territories actually organized as states, or the extraordinary problem of maintaining the political coherence and integrity of the Dominion of Canada.

Whatever the aid and encouragement to coherence provided by physical routes, economic integration, and other forms of social communication, the attainment of *political* coherence depends on the ability of the organized area to serve the *political* needs and purposes of its several parts. To the extent that these differ from region to region, the task of political organization is more difficult; if they are in direct opposition, political coherence may be impossible to achieve. But successful integration of the area as a unit may depend less on reconciling particular regional differences and more on the extent to which the over-all organization can demonstrate positive accomplishments for all the area. The failure of the Spanish kingdom, one of the oldest of the established political areas of western Europe, to develop coherent unity as a state, in the absence of any outside attrac-

tion, is no doubt due in large part to its failure to achieve political or economic advancement in general.

The requirement for political coherence of the unit area may be summarized as the need to develop political associations among all its regions, and between them and the over-all unit, which are stronger than political associations with outside areas and stronger than those within each region.

UNITY AT DIFFERENT LEVELS

These requirements for unity of a political area—homogeneity and coherence—apply to all levels of organized political areas, but only in proportion to the degree to which the area must function as an autonomous unit. At the level of the independent sovereign state the difference is not merely one of degree but of kind. At all subordinate levels inadequacies may be compensated for by aid or control from the next higher unit of organization. Only at the independent level must the unit area operate in critical relationships with other unit areas of the same level. At this level, therefore, effective unity is essential to viability, a topic to which we will return later.

VI. *Productive Strength of the Area*

In order to function as an effective political unit, every political area must be able to produce the necessary strength in manpower, trained personnel, and material resources to carry out the functions assigned it. For internal functions the requirements are usually within the capacity of the area to support.

However, in many of the underdeveloped countries, particularly in new states emerging from colonial status, there may be a deficiency of educated and trained personnel to carry on the functions of government. Similar situations may exist in political units at subordinate levels, as in the eleven counties in the United States which contain less than one thousand people. A more general problem arises from the relatively low economic surplus in most underdeveloped areas which limits the ability of their governments to promote rapid economic development, a function now required of political organization, particularly in such areas.

If the handicapped areas are subordinate units of larger unit areas which are much more productive, the resources of the area as a whole may be used to aid the poorer areas in order to provide a standard minimum level. To the extent that such aid is accomplished by controls, they may, as in the United States, indirectly alter the constitutional division of powers among the different levels of organization, reducing the authority of the states.

At the level of sovereign units each independent state is expected to get along at whatever level of services its production can support. But we are witnessing the first phases of a new development, as the successful states begin to recognize that their security—economic as well as political and strategic—may depend on maintenance of stability in less productive states.

The external functions of the independent state include that of maintaining its security in possible conflict with other states. Since economic production, in surplus, is one of the essential factors of national power, every state strives constantly to increase its productive strength. Few countries today can hope to do this either by expansion of territory or by expansion of settlement into previously unused regions. Increase in population, by increased birth rates or lower death rates, in itself adds little to the productive strength of most countries; rather, since economic strength comes only from producing more than the minimum requirements to support the producing families,

mere increase in numbers may well mean decrease in real strength. But all states have greater possibilities than ever before in history to increase productive strength by more efficient utilization of known resources and techniques, not to mention those as yet unknown but confidently anticipated.

It is true that there is a great range among the states of the world in resources for production, but there is far greater range in the degree to which those resources are effectively utilized (2). In every settled country in the world there is an excess of manpower working on farms, and in nearly all countries the use of the small amount of land needed for other industries would not seriously lessen agricultural production. But the proportion of the working population employed outside of agriculture varies from over 75 per cent in the most highly developed countries to as low as 20 per cent in underdeveloped countries. The proportion, as Kusnets has shown, correlates closely with such indexes as per capita income (5). In short, a predominantly agricultural state is an underdeveloped country, an area where little use is made of the greatest resource for economic production, namely, human brains.

Such marked differences among the various areas of the world are in no small part due to political organization. This is obvious to anyone crossing one of the critical political boundaries that divides units of successful political organization from those of less success, such as the southwestern boundary of the United States or the eastern boundary of Germany (Prussia) as fixed in the nineteenth century.

VII. *Viability of the Area as a Unit*

To be considered viable, a political area must have sufficient unity and productive strength to be able to perform the functions expected of it with a degree of independence comparable to that of other units of the same level and group.

At the level of sovereign states the political area must be able to function effectively as an economic unit, as a political unit, and as a military or strategic unit. Austria-Hungary, in the late nineteenth century, was fairly strong as an economic unit and as a military unit but was not viable as a political unit, as was finally demonstrated in the tensions of 1914–18.

Viability of a state is, therefore, a concept that is neither simple nor absolute, as the biological origin of the term might suggest. Further, the alternative is not simply death and burial; the area continues to exist. If found unable to function on its own, it must be added to the political area of one or more other units, an addition which may be not only unsatisfactory to the area added but disruptive to the unity of that to which it is added. Thus if one questions the viability of Albania, Libya, Haiti, or Paraguay as independent states, what alternative is feasible in each case?

Converse considerations throw light on the subject of the so-called buffer states. To perform a buffer function, there must be more than mere area and people between the potentially imposing forces and more than a paper-work political organization. The intervening area must have sufficient unity to utilize its potential strength for defense in either direction. Hence buffer units cannot be created; they can only be recognized and utilized where they exist. During the interwar period many students questioned the economic viability of an independent Austria; the critical question, as the event demonstrated, was whether it was politically viable.

We can illustrate the problems involved in evaluating the viability of unit areas by considering the challenge frequently raised against small states as anachronisms in the

modern world—a challenge, it should be noted, which applies not to a few but to many. More than half the independent states of the world have each less than ten million people.

The relation of size to viability is of particular concern in view of the existing international situation. To refer to this situation as a bipolar world may describe its superficial appearance but obscures its essence. The world situation today is dominated by the fact that one vast area organized as a political unit has expressed and demonstrated a continuing purpose destructive to the independent existence of other, ultimately of all other, political areas. Since the form of attack is not merely that of external force but also of internal disruption, it challenges the political, economic, and strategic viability of all the other states of the world.

Economic viability in the modern world is not merely a question of developing the maximum amount and diversity of production to provide strength in international relations. For one of the essential functions demanded of the modern state is that it shall make possible for the population of its area an increasingly higher level of per capita production and income. Are larger units of organization more able than smaller units to accomplish this purpose?

A larger area may include a greater number of the diverse raw materials needed for modern industry. This problem is not new and, generally speaking, has been handled satisfactorily under the normal system of international trade prevailing among peaceful states regardless of size. More critical is the increasing efficiency of large-scale production techniques and hence the need for larger market areas. But still more important for economic growth, as noted earlier, is the development of the maximum diversity of occupations and industries. Only in this way is it possible to utilize resources which cannot readily be moved but which exist in every settled area of the world—including many local raw materials and power resources but, most importantly, labor, local capital, and potential entrepreneurs (2).

In these terms we must recognize, on the one hand, that all states are too small to operate as tight economic units and that in large parts of the world even the union of many states—for example, a single state of all Latin America—would be far too small. On the other hand, Denmark might be considered a larger economic unit than Brazil or Indonesia in terms of diversity of development and even in absolute quantity of foreign trade. If we compare large and small states within the same general cultural area, as in northwestern Europe, the smaller economic units show a somewhat higher income per capita than the larger, presumably because the smaller states have accepted in greater degree the advantages of relatively free international trade.

What conclusions should be drawn from these apparently contradictory statements? A few tentative hypotheses may be suggested: (1) economic union of a group of states which under normal conditions of international trade have little exchange with each other is not likely to lead to major increase in economic development; (2) economic union between areas of notably different economic levels tends to produce a colonial relationship, which increases certain kinds of production in the colonial area but tends also to discourage the development of needed diversity in its economy; and (3) where a group of neighboring states of approximately equal level of economic culture, as in northwestern Europe, are found to have a large and highly diversified trade among one another, economic union may be expected to facilitate that trade and stimu-

late increasing diversity and total production of all its members.

The political viability of states is but little dependent on numbers of population or productive capacity, though some of the smaller and poorer states may lack the trained personnel and resources necessary to operate an independent state.

The critical question of political viability is the ability of the state to maintain its political integrity as a unit under the strain of great external pressure or in the face of strong external attractions. Without this political integrity, economic and military strength may dissolve into fragments. Every state therefore needs a distinctive concept of homogeneity strong enough to bind all its diverse regions into a cohesive whole that can function as a solid unit in critical relations with outside states.

It is in providing this distinctive concept that nationalism makes its positive contribution to modern political organization. The essence of a nation is the conviction that the highest group solidarity on which the individual depends for his sense of security is to be found, not in kinship, class, or occupational group, but in identification with an entire area considered as a greatly enlarged neighborhood consisting of a coincident section of land and people.

This is not the place to discuss the factors that produce a conviction of national solidarity, but, to avoid misunderstanding, it is necessary to emphasize that we are concerned with a political-geographic entity, not an ethnic or a religious one. Whatever the advantages of common language and however important the feeling of community in a common culture, the conviction of national solidarity can be created and made intensive and universal only by political ideas.

Since these ideas must be distinctive for each nation, research on the origin and evolution of nations must beware of universal theories and must search for the uniquely individual character of the national ideas of each particular nation and the political forces generated by such ideas. Until social scientists undertake such studies on each of the individual nations of the world, we will continue to lack any sound method for evaluating a nation.

One generalization, however, is clear from history: the state itself, as the strongest embodiment of political forces in its area, has the greatest opportunity to create and intensify its own national solidarity regardless of mere size. The states which have been most successful in developing national unity and likewise are most resistant to disruptive political doctrines include one of the largest, the United States, and at least several of the smaller, like Switzerland or Denmark. If existing small states were merged into larger units, those would then contain regional divergencies in political attitudes disruptive to national unity.

The problem of establishing coherence would be especially difficult because so few states have evolved a form of organization which permits marked regional differences within a coherent unit. Paradoxically, the only state in Europe which functions through an organization that might conceivably be suitable for such a large combination of former units is one of the smaller states, Switzerland.

It is in terms of the changed technology of warfare that the case against small states is most commonly directed. The great increase in offensive power of the most recent weapons in comparison with defensive power, and the even greater increase in mobility, tend to nullify the one advantage formerly provided by the compactness of the small state. This applies also, however,

to a medium-sized state whose industrial production is highly concentrated, as is true of France, Great Britain, or Italy. In terms of strategic air attack perhaps it applies in major degree to all states, regardless of size.

In that case the conclusions to be drawn are independent of size of states. Indeed, it has always been true that no state was large enough to maintain its independence on its own against all comers and that every state must rely to some degree on military alliance with others. The difference today is one of timing and, therefore, of operations. An effective military alliance must be more than the arithmetic or geometric sum of separate units. It must be integrated in production and operation and, therefore, in planning and training.

When we combine the political, economic, and strategic aspects of our question, the problem is this: how best to secure at the same time (1) the internal stability and national cohesion of existing state units, large and small; (2) the economic development and strength that may be expected from certain groupings into larger units; and (3) the strategic requirement of integrating the military potential of larger areas.

That adds up to no simple answer, such as the measure of how large a state should be. Rather it suggests that we should look to further developments along lines already indicated in current international arrangements. All these arrangements recognize the necessity of maintaining and using existing political areas which in past centuries have evolved into effectively organized units, but they also recognize that these areal units dare no longer view themselves as individually free to determine and change policies and conduct operations. Rather they must establish larger complexes of areal units with a sufficient degree of integration in each such complex to enable it to serve the function expected of it by its unit members.

Whether the functional interrelations of the several partially integrated complexes will ultimately make it seem necessary or desirable to establish complete political integration, at a new level of federated state, is a question open to speculation but hardly to analysis—surely not at this time to the drafting of blueprints. More immediate and fruitful results may be expected from studies in political geography aimed to describe and assess the consequences of these new forms of political organization now developing among state areas in the geography of the areas involved.

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Climate and society: a review of the literature[1]

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I

In many of the regions for which we have library data . . . the seasonal peak of intellectual [library] activity is superimposed upon the low level of health which normally prevails at the end of a cool or cold winter. Thus a state of strain is presumably produced because an impulse toward vigorous mental effort is opposed by a contradictory impulse toward physical relaxation. It is this contradiction, apparently, which so often causes February and March to be a period of tenseness and nervous exhaustion, especially in the northern United States.—ELLSWORTH HUNTINGTON [8, p. 357].

It is hoped that the discussion which follows will not add to the burden of seasonal "tenseness and nervous exhaustion" in explanation of which Ellsworth Huntington offered the hypothesis cited above. It seems, however, that a comparable burden has become an almost constant feature of modern life, and it is the suggestion of this paper that an explanation thereof may be found, certainly in part, through consideration of the implications of the general subject in which Huntington and others so interested themselves.

In this technology-saturated era we are witnessing daily the increasing tempo and effectiveness of man's mastery of his natural environment—intended, or so we are given to understand, to provide him with the material comforts considered necessary for "happiness" and the opportunities to pursue his "higher interests" and so, hopefully, to enhance the prospects of freedom and stability in the political and social spheres. However, it has become increasingly evident that these extraordinary achievements have been only partially successful in these latter respects. Indeed, because of the attendant and unparalleled acceleration of social change, this era has, according to some views, abetted, if not produced, quite a contrary effect, on the order of the "melancholy accident" which Thoreau foresaw. While in our society today it may not be quite accurate to say that "the mass of men lead lives of quiet desperation," there is considerable evidence indicating, as De Tocqueville feared (and as Thoreau would agree), that "a kind of virtuous materialism may ultimately be established in the world which would not corrupt, but enervate, the soul and noiselessly unbend its springs of action." To employ the prevailing concept, the problem is one of man's "alienation" from the world in which he has evolved.

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[1] A revision of "Geopolitical Aspects of Climate Distribution: Review and Commentary," a research paper prepared for a graduate seminar in "Geography and Politics," Professor Harold Sprout, Princeton University, spring, 1959. My thanks to Professor Sprout for his encouragement of interest in this field. The views expressed in this paper are those of the author and do not necessarily represent official views or policy.

Perhaps some insight into this dilemma can derive from consideration of some studies of our natural environment which, in this author's view, serve to indicate that the character of man's assault on nature has reflected a failure to comprehend his place within it and that the technological emphasis represents a very narrow, inevitably incomplete, and distorted conception of that relationship. As Lawrence K. Frank has put it:

> To say that we are waiting upon broadly conceived formulations of man's relationship to the natural environment is merely to recognize how greatly we need a new conception of the relation of man to the universe and realization that man is a part of nature, not outside nature, as our theological traditions have for so long insisted. As Alfred North Whitehead has so cogently remarked in *Adventures of Ideas:* "It is a false dichotomy to think of nature *and* man. Mankind is that factor in nature which exhibits in its most intense form the plasticity of nature" [3, p. 360].

It is not unreasonable, then, to suggest that the "alienation" and consequent unhappiness of man may be related to his ignorance of his place in nature. And yet—paradoxically, perhaps—it is reassuring to come to this realization, for at least it marks, hopefully, a route to be followed.

It is clear that, for an adequate understanding of man's relationship to his natural environment, we must appreciate the many implications of his evolutionary development, during which he developed the capacity for his existence and perpetuation and for maintaining his highly complicated physiological processes, including reproduction.

As is readily apparent, apart from the distribution of land and sea, the most important aspect of the environment in which man has evolved is *climate,* speculation about and study of which has had an extensive and fascinating history, and which, to judge from recent work, perhaps stimulated by the current space "rivalry," is receiving renewed attention.

Well known in the modern period is the work of Ellsworth Huntington, until his death in 1947 perhaps the foremost exponent of the macrogeographic theory of climatic influence upon human behavior and the development of civilizations.

Before entering into discussion of the works of Huntington, Clarence A. Mills, Raymond H. Wheeler, and others, it is instructive to note the long history of this intriguing subject. Although, in recent years particularly, science has accumulated a considerable body of evidence regarding the specific effects of climate, especially weather, upon human beings, it is important to note, as expressed by Mills, that the awareness of a connection between the solar system and human welfare is older by far than recorded history. People believed that such outside forces exerted potent and direct influences over human affairs, and the astrologer's advice was always in demand. Mills is correct, I believe, in pointing out that, "when men later discarded such primitive beliefs, they ignored the intuitive rightness of the feeling that humanity was not entirely its own lord and master. Humility was replaced by a laboratory-gained egotism as scientists obtained ever-increasing control over their physical environment" (10, pp. 4–5).

II

As indicated by Thomas (14), Wheeler (17), and Visher (16) in their surveys, the recorded thoughts of men since antiquity have dwelt interestingly, if not accurately, upon climatic influences; in fact, *On Air, Water, Places* (400 B.C.) was used as a reference as late as the 1920's. In this work, Hippocrates concluded that regional climatic differences explain significant differ-

ences of peoples; further, in the far more modern tradition, he made allowances for topography, food, and social organization.

Common to a succession of writers who dealt with the subject up to the medieval period was the theme that those peoples who lived in the so-called intermediate (temperate) climatic zones were superior and more fitted to rule than those of the northern or southern zones. It was acknowledged, however, that the northern peoples were tough fighters, whereas the southern peoples were looked down upon as weak and dull.

The work (A.D. 1360) of ibn-Khaldun marked the beginnings of a transition from the barrenness of medieval writing in this field to a new era of analysis and discussion. Khaldun discussed the social and cultural effects of climate as well as its effects upon race and pigmentation. By virtue of perhaps questionable reasoning, he classified the Arabian climate as temperate, thus making his theory of the superiority of peoples in the middle latitudes square with his desire to show the supremacy of his own people, as was done by Greek, Roman, and later writers for their respective nations.

Though contributing little that was original, Jean Bodin (1530–96) is credited with the first systematic discussion of the influence of geographic environment on human society. With due allowance for the part played by his astrological and physiological beliefs in his conclusions, Bodin's contribution lay in the extensiveness, systematic consideration, and theoretical approach of his work.

In an *Essay concerning the Effects of Air on Human Bodies* (1733), John Arbuthnot, acknowledging his debt to Hippocrates, presented a more comprehensive treatment of atmospheric effects on mental and physical traits, stating that "air operates sensibly in forming constitutions of mankind which are found to vary much in different countries and climates." He declared, further, that governments "are powerless to change the genius and temper of a race against the force of air and climate."

Montesquieu (1689–1755), well known for his contribution in this field, is reported by his biographer to have gained his climatic orientation from Arbuthnot's work. In a comprehensive treatment, Montesquieu credited climate with influence upon peoples' character, domestic and conjugal conditions, and political conditions. He concluded that the nature of manners and customs is determined to a marked degree by environment and that individuals and nations are conditioned by external environment. The accuracy and modernity of his views are noteworthy.

In his *History of Civilization in England* (1862), Henry Thomas Buckle concluded that climate, soil, and food are bound almost inseparably and that the indirect effects of climate were a major environmental influence. He stressed the influence of climate upon energy and suggested that effective progress depends on energy.

John W. Draper, in his *History of the Intellectual Development of Europe* (1863) and in a later work, *The History of the American Civil War,* contributed the following to the theoretical discussion of the influence of physical agents upon mankind: (1) that historical phenomena are amenable to physical laws and (2) that response to environmental influences was one of the laws governing social and intellectual evolution.

L. F. Alfred Maury (1817–92), though presenting some extreme conclusions after reviewing the important effects of climate upon people and forms of government, made this important observation: civilization tends to become uniform with the growth of knowledge and the means of communica-

tion, but—a qualification—climatic and geographic limitations tend to prevent complete uniformity.

Herbert Spencer (1820–1903) declared that the highest civilizations develop in the temperate zone but reasoned that the primary stages of human life took place in the hot climates which offered the least resistance to survival. Spencer emphasized humidity and dryness as well as temperature. And, more so than had the previous writers, Spencer emphasized the part played by the social environment in human society.

In her comprehensive work, *Influences of Geographic Environment* (1911), Ellen Church Semple, pupil of Friedrich Ratzel (1844–1904), granted somewhat less prominence than did Ratzel to climatic influences—though significant, nevertheless. She concluded that climate directly influences density of population, health, and reproduction and that it "enters fundamentally into all consideration of geographic influences, either by implication or explicitly"; that it has a direct effect on pigmentation, disease, and energy; an indirect effect by determining crops, animals, and modes of life in a locality, the topography, and the limits of human life; it gives rise to commerce through its effect on differentiation of people and modes of life; and it has an effect on human temperament.

In the more recent period, in addition to Huntington and the others whose work is reviewed below, that of E. G. Dexter (1863–1938) is noteworthy. Dexter was concerned with the temporary atmospheric changes (weather conditions) because of his conviction that weather is universal in its operation on people. He claimed no direct determination of human behavior but was convinced that it was an important contributing factor. In *Weather Influences: An Empirical Study of Mental and Psychological Effects of Definite Meteorological Conditions* (1904), his account of his studies of temperature, barometric pressure, humidity, wind, character of the day, and precipitation in relation to human behavior indicated significant correlations between weather and conduct, suicides, insanity, and concentration of attention.

The studies of J. Russel Smith, *Industrial and Commercial Geography* (1913), Henry L. Moore, *Economic Cycles: Their Law and Cause* (1914), and Edgar L. Smith, "Tides in the Affairs of Men" (1938), indicated correlations between economics and certain kinds of climatic fluctuations. As the latter Smith wrote, "Within the economic pattern of a period, the tidal ebb and flow of mass psychology in response to the rhythms of environmental change cannot be safely disregarded."

III

In his essay on "Climate and Human Behavior" in the *Encyclopedia of Psychology* (1946), Raymond H. Wheeler asks whether the investigators cited above were wrong or, perhaps, insane; his answer is "obviously not. It is patent to any intelligent person that different climates produce different fauna and flora. Why then should they not produce different kinds of people?" (17, p. 80).

Although such a simple relationship as Wheeler declares must be modified, in some respects drastically, in light of the results of more recent investigations, especially as it pertains to its geopolitical consequences, Wheeler nevertheless makes a valid point, I believe, in indicting the skepticism and disbelief of those who would answer "Yes!" to the query posed above. As Mills has put it, "People have always bristled at the suggestion that they are not lords of creation"; needless to say, they still do.

After reviewing the work of some of the men cited above, as well as of Huntington

and others, Wheeler describes the "Kansas Project" which he led. According to Wheeler, it began by accident with a review of the history of psychology, whereupon it was noticed that the antecedents of psychological theories alternated with one another down through the centuries, simultaneously with corresponding shifts in point of view in biology and philosophy. This led to a study of other culture products, and it was found that a culture pattern representing all important phases of human activity was fluctuating back and forth in rhythmic fashion. The manner in which climate came to be involved was another accident: it was noticed that the culture curve resembled the California sequoia tree-ring curve. This, in turn, led to collection of data on climatic fluctuations. The list of sources which Wheeler cites regarding the history of climate must impress even the most skeptical critic—tree rings, lake levels, river levels, drought and flood chronologies, famines, harvesting dates, ice-forming and ice-breaking dates, glacial advance and recession, bog formation, pollen analysis, sunspots, and many other sources.

It is interesting, if not highly instructive, to note in this connection that historians and others appear to have no qualms about accepting such geological evidence as regards the *pre*historical periods but are highly reluctant—if they do not reject it outright—to do so for the relatively brief period of recorded history.

One may accept Wheeler's conclusion that there is a "world climate, though never completely homogeneous," while questioning the broader conclusions arrived at correlating climate with the rise and fall of nations and cultural changes. But one must view with some respect the evidence presented which leads to Wheeler's assertion that "enough data have been collected to justify the statement that unless the cultural curves are climatically conditioned, the coincidences violate all the laws of chance and are utterly inexplicable in the light of present knowledge" (17, p. 81).

The all-too-human tendency to reach for broad conclusions on the basis of reasonable microlevel evidence is unfortunate, especially if presented in positive terms, and, most particularly, when stated by men knowledgeable primarily in one field who extend their conclusions to cover other or all fields. This may be said to be the chief defect of Clarence A. Mills in his otherwise valuable work, *Climate Makes the Man* (1942). When Mills asserts that man "is not the independent master of his own life . . . but instead is pushed hither and yon by large outside forces . . . [and] could learn a great deal from the primitive sun-worshippers for he is still a veritable pawn of the universe" (10, p. 8), he seems to have been carried away by his own speculations. His efforts toward a correlation of temperature and historical events—as in his chapter on "Thermometers and History" and his paper, "Temperature Dominance Over Human Life"—represent, in part, an unfortunate exercise of the type of single-factor analysis deserving of the criticism it has received. Unfortunately, as is frequently the case in such a situation, reaction to this aspect of his work has tended among many writers and students to obscure the merits of the essential, less dramatic aspects. Such critics have often devoted considerable effort to knocking over the straw men they have constructed of the weak points of the presentation.

(A case in point is surely Jean Gottman's treatment of the broad subject in his paper "Geography and International Relations." The orientation of his critique is reflected in the following quote: "The paradoxical point in such theories is that, starting from the stability of the environment in the

search for the permanent laws governing internal relations, geographers came to an emphasis on the possible instability of these physical conditions. The trend of the investigation ought to be enough to demonstrate that it took the wrong path" [4, p. 156]. In rebuttal one need hardly comment beyond the observation that the quotation reflects a surprising lack of familiarity with the history of the scientific method as well as with the method itself, but it is revealing also to note that the "starting" point referred to is necessarily an assumption of the author.)

Mills's analysis of animals and man as energy machines, the functions played by heat loss and diet in their relative vigor, and the relation of these factors to temperature are surely of marked significance in assessing the role of the natural environment in the behavior of animals and man. His investigations of laboratory animals under carefully controlled conditions and of man and domestic animals in both temperate and tropical climates indicate the important relations of temperature to reproduction, physical growth, and mental acuity. Further investigations provide evidence of correlations between climate and various diseases, weather and respiratory infections, atmospheric pressure and human and animal "moods." Mills also examines the effects of variations of sunspot activity and the intensity of solar radiation on the earth's climate. And Mills's invention of reflective radiant air-conditioning, which apparently can provide proper indoor temperature conditions without setting up sharp differences between air conditions inside and out, leads one to wonder why such a system has not achieved widespread usage.

If for no other reason than his enormous output, the work of Ellsworth Huntington (1876–1947)—author or co-author of twenty-nine volumes, chapters in twenty-eight other books, and some one hundred and eighty articles—in this field is entitled to respectful consideration. But it is for much more than reasons of volume that I have found Huntington's *Civilization and Climate* (1924) and *Mainsprings of Civilization* (1945) as well as selected portions of others of his books worthy of study. It was, in fact, fascinating to accompany him as he presented, in the words of one reviewer, "interesting data, intriguingly arranged on strings of hypotheses," and to follow him as he "shows the way to that intellectual infinity where parallel lines of thought meet."

No doubt the foregoing will indicate lack of competence on my part to view more critically aspects of his work toward which the biologist, anthropologist, geneticist, physicist, historian, psychologist, and sociologist would raise a skeptical eyebrow. So be it, but I am not unaware of the tenuousness of many of his hypotheses and suggestions, as even a cursory reader could not help but be aware, since Huntington himself repeatedly and pointedly brings this to his reader's attention, at the same time encouraging, as he does, further research in those areas. One example should serve to illustrate this point: in discussing his section on cycles, he states:

> One hypothesis in this section seeks to explain an apparent association of atmospheric ozone with animal reproduction. Another is based on a seeming connection between business cycles and atmospheric electricity. The author is well aware that these new ideas need careful experimental testing. Even if they prove sound they will inevitably have to be greatly modified. Nevertheless, even in their present preliminary form, they ought to stimulate wide discussion and investigation [8, p. vi].

And, surely, it is this promise of fruitfulness which we ought to bring into focus.

In *Mainsprings of Civilization*, Huntington consolidated and elaborated upon his knowledge and observations in a truly grand

attempt "to analyze the role of biological inheritance and physical environment in influencing the course of history." Reflected in this work are many of Huntington's contributions to theory (as summarized here by Visher [15, p. 6]): (1) past climates have been characterized by significant changes which were irregular in occurrence, not simple cycles or progressive trends; (2) changes in the sun are a major cause of changes in terrestrial climate; (3) climate has profoundly influenced man, his culture, other forms of life, and geologic processes; (4) even weather has, through brief and erratic changes, affected man's energy, health, and longevity and his attitudes and achievements; (5) the distribution of the various levels of civilization corresponds roughly with the climatic regions; (6) the climate best suited to intellectual activities and progress is characterized by a well-defined seasonal pattern having frequent changes of weather and sufficient warmth and rainfall to permit extensive agricultural production; (7) civilization has tended to shift into cooler climates as mankind has advanced in his culture (a theory first advanced by Spencer and elaborated on by Gilfillan and Stefansson); (8) in this movement of civilization toward colder regions, each of the chief crops and types of farm animals has improved in yield and quality (a latitudinal phenomenon apparently first observed by Huntington); and (9) selective migration and selective survival, together with intermarriage of people of relatively homogeneous cultures (Huntington's theory of "kiths"), have profoundly influenced the course of history.

Despite the marked emphasis on climate reflected in this summary, Huntington's final effort, *Mainsprings of Civilization*, was, as indicated previously, an attempt to analyze the total role of biological inheritance and physical environment. Moreover, it was, as Huntington explains, "part of a still larger plan which includes an interpretation of the main trends of history in the light of these two factors as well as the cultural factor which is generally the main topic in histories of civilization."

It is true that in Huntington's view the importance of climate, lying in the following, is not to be denied:

> (1) Aside from the distribution of land and sea, climate appears to be the most important physical factor in determining the habitability, occupations, and mode of life in different parts of the world;
>
> (2) No other known physical factor, when considered directly and indirectly, has so great an influence upon health and vigor;
>
> (3) No other feature of physical environment is so variable from one period to another, as well as from place to place;
>
> (4) Both in the United States and the world at large climate seems to set a basic pattern of civilization upon which other factors impose variations with all degrees of magnitude [8, p. 263].

It is unfortunate, however, that one of our frailties as "reasoning" animals is the tendency to think that, when someone analyzes or emphasizes one aspect of a total situation, he is thereby ignoring or is unaware of other aspects. But it must be remembered, as Freud has written:

> We have no way of conveying knowledge of a complicated set of simultaneous processes except by describing them successively; and thus it happens that all our accounts err in the first instance in the direction of one-sided simplification and must wait till they can be supplemented, reconstructed, and so set right.

And, as Louis Hartz has written in another context:

> There is no "secret" or "key" to the historical process, or, if there is, we certainly cannot know it. But we must not, because of this, brand as fruitless any attempt to isolate a significant historical variable and to study it by consistently comparing cases. If we do, we shall have thrown out, along with the bath water of false monisms,

the very baby of scientific analysis. Granted that a single factor cannot illuminate all situations, it can still illuminate many. And these, given what we want to know at any moment, may be very relevant indeed.

Nor is it sufficient to counter with the simple assertion that, though many writers have declared consideration of the complex of factors involved, they have then simply gone on to employ the one as determinant (i.e., single-factor analysis). Careful reading of Huntington would establish that this is not the case. He himself seeks to explain: "When we recognize the importance of one factor we do not thereby prove that other factors are unimportant." Further, as Visher points out, perhaps the greatest merit of Huntington's successive studies is that they revealed the increasing complexity of the subject with the result that the simpler relationships and principles announced by most earlier workers turned out to be inadequate.

As I disagree with the essence of O. H. K. Spate's critique of Huntington in "Toynbee and Huntington: A Study in Determinism," I would be remiss if I did not take up the issue here. The crux of the critique, reflected in the title, lies in Spate's view of Huntington as a "thoroughgoing environmentalist" whose "determinism is avowed" (12, pp. 406–7). I believe this to be an exaggerated interpretation, despite Spate's acknowledgment of certain fruitful aspects of Huntington's work. Huntington's concern in "tracing of pattern in history" does not necessarily, as Spate reasons, imply a "measure of determinism." Surely, one can pursue such an interest apart from considerations of determinism. Exploration (deliberate or spontaneous) of such an interest does not necessarily involve commitment.

Spate asserts that, "all allowances made, it remains true that his pattern is too much determined by physical factors, and gives too little play to the autonomous development of societies" (12, p. 414), as though this were an error both of premise and of conclusion. To be sure, if "pattern" implies "determinism" and if the focus of interest is the physical environment, Spate is correct—on his own terms. If, however, one investigates the influence of physical factors and emerges with evidence of a pattern, should one deny the evidence any more than accept the pattern uncritically? To say that Huntington's pattern is too much determined by physical factors is really to say that he should have been concerned with other factors; his works make it clear that he was. But, as previously quoted, how else to convey knowledge of a complicated set of simultaneous processes except by describing them successively?

When Spate criticizes Huntington's treatment of "such immense movements of the human spirit as the great religions," asserting that "his approach is far too external, lacking the sympathetic insight" (12, p. 406), I am impelled to suggest that what is indicated here is Spate's failure to comprehend that an appreciation for the role of nature is, or can be, fully as "spiritual" as any of the great movements; nor is this too external or lacking in sympathetic insight. Where, later on, Spate asserts that Huntington's "overemphasis on the Afrasian arid environment, important as that is, ignores the fact that great faiths have their own life and growth" (12, p. 417), misunderstanding is again evident, since what Huntington was so obviously trying to do was but to suggest one possible idea concerning the origin of that life—as is readily perceived in what follows here. Earlier, Spate challenged Huntington's suggested correlation between religions and environment, between monotheism and desert regions, and between animism and tropical jungles. Huntington had written:

> Note the contrast between the fears and hence the spirit world of the desert and jungle. . . . Out in the desert . . . the things that man chiefly fears are big—winds, sun, cold, heat, drought. They have little of the local, intimate quality of the jungle man's mud holes, snakes, sticks, and malevolent mosquitos. . . . Hence it is natural for the primitive desert man to pin his faith to a few powerful gods who rule large areas. This does not compel him to believe in a single god, but it makes the transition to that belief easy and natural. It would be false to say that belief in one universal God necessarily evolved in a desert, but it is true that the evolution of such a belief is more probable there than in the jungle [8, p. 293].

But Spate asks "Why?" declaring, "One might think that an isolated rock or bush, vital as a landmark, is much more likely to be the dwelling of some *genius loci* rather than a rock or bush lost amidst thousands of its fellows; and the rarer the lizard, surely the more potently significant" (12, pp. 415–16). One may choose to think this, to be sure, but, having sojourned in both desert and jungle, I believe Huntington's perception to be accurate. Spate's response appears to be a function of his "distance" from nature and reflects a view far too external and lacking in sympathetic insight.

Nor can I agree with Spate that the weight Huntington attaches to heredity "can be discounted since he here evolves a theory of group qualities and aptitudes originally largely molded by physical, especially climatic, influences, and so refers back to environment at a remove" (12, p. 418). Granting the part played by some environmental influence in heredity, Huntington clearly indicates an autonomous role for heredity in the interplay among it, physical environment, and culture, namely, that the influence of heredity can so modify or compensate for the influences of environment—and may be reflected in culture—that vital aspects of heredity transmitted to future generations may be said to be autonomously derived.

Concluding his analysis of "The Interplay of Culture and Heredity," Huntington states:

> One of the most important requisites of an enlightened study of geography, anthropology, psychology, sociology and history is the universal recognition that every human situation depends upon the combined effect of heredity, physical environment, and cultural endowment. Progress in such studies has been hampered in the past by the tendency of most students to ascribe special, or even complete potency to one of the three factors at the expense of the others [8, p. 169].

Although Visher's assertion that Huntington "was keenly aware that the physical environment generally is of secondary or indirect significance for mankind" (15, p. 7) is not entirely correct, in my view, Huntington said enough about human culture as far back as 1915 (7, 1st ed.) to show that he fully appreciated its importance. In his explanation of the difference between aboriginal America and the Old World he notes:

> The distribution of civilization in the pre-Columbian America merely brings out the fact which I have again and again tried to emphasize: although climate is highly important there are other factors whose weight is equally great. Even if our hypothesis be fully accepted, no less importance will thereby attach to the other great factors which condition the events of history. Because a man dies for lack of air, we do not think that air is more essential than food, drink, warmth [7, pp. 369–70].

In somewhat more concrete fashion Huntington states, in a subsequent discussion, that "there seems to be much truth in the idea that man's social progress constantly alters his relation to climate. In the past great inventions have helped chiefly in enabling man to overcome low temperature; in the future, perhaps, they will help him in

equal measure to overcome high temperature, dryness and monotony" (7, p. 398).

For our purposes the foregoing quote reflects the essential contribution of S. F. Markham's study (9) a generation later. Portions of Markham's study were subsequently acknowledged with praise by Huntington (8, p. 401). It was disconcerting to note, however, that the "take-off" point for Markham's study was based on the use of questionable reasoning in his controversy with Huntington and others who hypothesize that climatic fluctuations may help account for shifts in leadership of civilization. The dispute concerns the *degree* of climatic change.

Ignoring much of the geological evidence of such climatic cycles as cited by Huntington and the others, as well as the historical evidence of climatic changes reflected in certain crops and domestic animals in Greenland and vineyards in Britain, for example, Markham refutes Huntington's purely hypothetical example of the consequences of a transformation of the climate of Athens to a climate comparable to that of New York or Chicago. Markham thereupon concludes that, to account for the growth of civilization, "we must look deeper," and he is "convinced that one of the basic reasons for the rise of a nation in modern times is its control over climatic conditions" (9, pp. 12–20).

It is therefore surprising, to say the least, to read, further in the book, Markham's description of a climatic change at New Haven, Connecticut, which he describes "as great as if New Haven had been moved southward as far as Atlantic City. . . . A similar change has been widely observed elsewhere." And, interestingly enough, Markham had introduced this particular discussion by stating that "there is considerable evidence that the climate of all parts of the world fluctuates in long cycles" (9, p. 179). (The latitudinal distance between Athens and New York is approximately 2° 40′; between New Haven and Atlantic City, 1°55′.)

Let me hasten to state, lest I myself be accused of setting up a straw man, that the foregoing does not negate the usefulness and inherent interest of Markham's evidence and theory. Quite properly, he emphasizes the significance of the hypocaust system of heating and baths, of the Romans as master "heating engineers," of the inventions of the chimney, fireplace, and grate, more advanced home and building construction, clothing, the stove, the use of coal and other energy sources—of forms of climate control, in other words—as a factor in the growth of civilization. Accepting the general principle that a kindly climate—the closer to the "ideal," the better—is conducive to the growth of human culture, Markham's investigations establish that the "higher" civilizations have developed in the regions which have had both the most easily controlled climate and cheap and effective means of control.

Unfortunately, Markham commits the mistake, as did Mills, of pressing a useful theory too far in using it (plus numbers of population for national defense) to account for the rise and fall of civilizations such as Greece, Persia, and Rome. While one may allow for the exuberant speculation that "mankind is on the verge of a development which may alter the whole focus of civilization [air-conditioning]," it is surely making too much of a good thing to conclude that "we have seen how civilization follows man's control of his own environment. . . . In human history, clothing, tools, and the control of cold, heat and damp replace natural selection" (9, p. 213). In terms of his own presentation, Markham's failing is, essentially, that he has dealt with but one climatic feature—temperature.

Turning now to a climatic study more restricted in scope, a great merit of Marston Bates's exposition of his love affair with the tropics, *Where Winter Never Comes* (1), lies in his merciless exposure of the distorted viewpoint with which most Western people view the tropics. In this sense, his work is in refreshing contrast to that of all the writers discussed up to this point. It is difficult indeed to quarrel with him when he declares his conviction that "the difficulty lies not so much in the nature of the tropics as in the nature of Western civilization"; that, indeed, our ethnocentric bias is at once apparent in our confusion of "civilization" with *Western* civilization; that, for example, our description of the tropics as "hot and sticky" is a Western view; and that "the white man's burden" is not one imposed by the tropics or its peoples but the burden of the white man's own culture (trousers and tie, for example) carried into an alien environment.

Obviously, it is not enough to point out that our view of the tropics is a distorted one. One may sympathize with Bates's long rebellion "against the toplofty attitude that the western world is apt to take of the tropics" and pass over his "anti-Huntington" motivation, which he makes quite explicit, for his work has also the more practical merit of illustrating the inadequacy of our knowledge of the cultural as well as physical aspects of disease, diet nutrition, clothing, soil chemistry, air-conditioning, and construction in the tropical regions. His points are well taken when he states that Europe in past centuries was as unhealthy as any region in the tropics today and that food is just as culture-bound as clothes and language and then goes on to hypothesize that the science of nutrition is, perhaps, also culture-bound. Bates establishes the vital point that physical labor is as essential to health and vigor in the tropics as elsewhere, for white man as well as colored. And his proposal for the indigenous development of a science of the tropics merits follow-up if not yet under way.

But Bates's own analysis is distorted, especially in terms of his avowed anti-Huntington thesis, by his failure to recognize all essential aspects of the analysis of Huntington and others—for example, the effects of weather variation (cyclonic storms)—and in his further failure to account for the disparate development of Western science and that in the tropics. (Also, although Bates claims to have read both *Civilization and Climate* and *Mainsprings of Civilization*, his references to Huntington's work appear to be taken exclusively from the former.)

No less a deflator of Western ethnocentrism and debunker of Western attitudes toward the tropics than Bates, Earl Parker Hanson makes it clear that it is the white man's chosen way and structure of life that is at fault: "Regardless of climate, it seems certain that the white man has in the tropics walked into the trap that the ancient Chinese, according to legend, once set for the conquering Manchurian: he was simply caught in the enervating effects of being temporarily lord and master" (5, p. 293).

But, more importantly, as Hanson indicates in his initial discussion of recent efforts toward development of the Amazon Basin, attitudes are changing, and, "under such changes in attitude toward it, the region itself changes appreciably. The former obstacles to its development are transformed into scientific problems" (5, p. 32). In pursuing this theme, Hanson presents an effective case for the conclusion that many of the physiological effects of climate formerly regarded as "unhealthy" are not so unfavorable to human development; that proper nutrition (fats and proteins) and clothing, disease control, adequate medical and prophylactic precautions, and an otherwise

normal, healthy life leave nothing to be feared in the tropics. The experience of Western soldiers in World War II is cited as evidence in this regard. However, it would seem to burden a good case to imply that scourges such as malaria are explicable in nutritional terms.

In highlighting the more favorable and promising experiences of tropical peoples (South and Latin America, the Caribbean, and Africa) in their efforts to develop as modern nations with improved standards of living, Hanson fails to deal adequately with the enormously vital demographic problem in certain areas. Perhaps it was his implicit assumption that the problem will in the nature of things resolve itself; yet, as is now well known, experience has shown that attendant with the improvement in disease control and in general health conditions that spring from the modernization and industrialization (so strongly recommended by Hanson) is a tremendous upsurge in population that may exceed the rate of development needed just to sustain the previously existing minimum levels of living. It also appears that Hanson takes too much for granted the availability, if not the inexhaustibility, of resources.

In examining Iceland, the Polar Sea, the Arctic, and Alaska, Hanson also shows an affirmative appreciation for the potential of the colder regions as human habitat and for modern development; that with proper use of indigenous resources and methods of agriculture, adequate diet, proper clothing, appropriate heating methods, and permafrost-adapted construction a northward as well as southward "expansion" is possible. His reports of Soviet, Icelandic, and Eskimo experience are impressive and enlightening.

But it is surely a case of being carried away by the persuasive intimacy of one's own experiences for Hanson to claim that "everywhere, whether in Alaska, South America, or Africa, the basic problems of frontier development, and the broad outlines of studies devoted to such problems, are relatively simple and alike. The most astonishing thing about social and economic growth is the ease with which it is achieved once psychological, political, and other barriers to it have been removed" (5, p. 360).

Once again, as with Bates, a distorted view is taken, I believe, of important aspects of the work of many climatic theorists, as is perhaps best reflected in the following conclusion of Hanson: "Man not only started in the tropics when he began to spread all over the world, but he is still an equatorial animal and cannot live in any climate but the tropical—provided either by nature or artificially by man himself." Intriguingly presented, at first glance, but it is apparent that for Hanson "climate" is temperature. Also, the implication is only for survival, and, as Visher has stated, survival is biologically inadequate; reproduction and maintenance of culture and of some cultural progress are essential.[2]

On a more scientific basis, and with considerably greater detachment, the authors of *Temperature and Human Life* (18), C. E. A. Winslow and L. P. Herrington, present the results of a project investigating the title subject. Using the threefold approach of physics, physiology, and environmental hygiene, laboratory investigations were made of the physiological reactions and physical stimuli involved in the problems of man's relation to his thermal environment. It was

[2] What is perplexing about the views of writers with the viewpoint of Hanson and Bates is that, while they laud evidences of "high" civilization on the part of native peoples and condemn, in a sense, the so-called civilization of the more technologically advanced nations, they conclude by recommending the utilization of that technology; but, clearly, the two are not so readily divorced.

determined that heat interchanges vital to human life basically depend upon the following definite physical and physiological factors (18, p. 56): *physical factors,* air temperature, air movement, relative humidity, and mean radiant temperature; *physiological factors,* surface area, effective radiation area, area of evaporating surface, mean skin temperature, and available moisture for evaporation.

Subsequent research resulted in fruitful data regarding the physiology of clothing. This led to conclusions regarding, among others, effectiveness of layered clothing, underwear of plastic fibers with air bubbles in them, and aluminum-surfaced clothing in dealing with the heat-exchange problem in cold temperatures, as well as minimum wear of clothing in the hot zones. Promising results of indoor climate control were indicated from investigations of winter and summer air-conditioning, building construction, insulation, and orientation.

A survey of information available on the relation of climate and season to health led to the conclusion that predictions can be made concerning only the following: (1) extremes of heat and cold are definitely harmful and (2) even moderately hot conditions increase susceptibility to intestinal diseases and moderately cold conditions increase susceptibility to respiratory diseases—simple conclusions but, the authors assert, of far-reaching significance both from an epidemiological and from a physiological standpoint (18, p. 255). During the research involved in the foregoing, the authors concluded that socioeconomic factors were of greater statistical influence than climatic factors in certain diseases earlier investigated by Mills.

IV

What are we to conclude from all this? First, we may say that these studies indicate that, to a considerable extent, control of certain climatic effects may, for the human organism, now be regarded as a threefold problem in engineering: (1) internal control—nutrition; (2) surface control—clothing; and (3) external control—air-conditioning and construction. (There is also, of course, an interrelationship among them.)[3]

Second, some implications for the student of conflict resolution are readily apparent; Mills, Markham, Bates, Hanson, and Winslow and Herrington have made it explicit that the physiological effects of climate as an aspect of the influence of physical environment upon man can, to a considerable degree, be controlled or compensated for by application of current knowledge concerning clothing, nutrition, air-conditioning, and techniques of construction—in both the tropics and the arctic as well as the temperate climatic zone. Further, that use of indigenous resources and methods of agriculture (including, especially, greater knowledge of the soil chemistry of these areas), combined with proper methods of construction and applicable techniques of our advanced technology, can make possible the expansion and growth of civilization as well as, unfortunately, military operations, north and south. And, as indicated by Hanson, the effort may provide partial releases for the energies of men, capital, and technology.

Third, it is clear that an enhancement of the welfare of peoples currently existing at minimum levels and the development of areas long neglected or ignored can be real-

[3] It is apparent, however, that the weather factor which has attracted the most intense interest and active research has been that of temperature. This may well be where the emphasis properly belongs. But it might also be very fruitful if comparable attention were given to humidity, atmospheric pressure, air circulation, and ozone.

ized in time, providing the manifestly severe short-run costs are accepted—and, most importantly, providing the demographic and resources problems can be resolved.

Fourth, there are implications, also, for more limited sectors of human activity in that information gained from the studies cited above may be utilized in establishing more effective personnel policies for military services, business concerns, and other organizations confronted with operations in the more extreme climates, as well as for improving the health and comfort of people currently inhabiting the temperate areas.

The foregoing exposition of man's increased (and no doubt ever increasing) ability to control or compensate for certain climatic effects, as well as to "change the face of the earth," does not, however, satisfy other and possibly more profound questions raised by the work of Huntington, Mills, Wheeler, and others concerning the role of climate in human growth and behavior: its interaction with heredity, cultural phenomena, and other aspects of the natural environment in the development of civilization.[4] Questions which reflect, for example, the apparent psychological (and perhaps autonomic) effects on man by climatic phenomena such as weather factors and their variations, sunspot activity and atmospheric radiation, long and shorter-run climatic cycles, and others.

In this regard perhaps we all would do well to practice Coleridge's "willing suspension of disbelief" which Lionel Trilling suggests is an essential part of scientific as well as poetic faith—science properly understood as "organized improbability, or organized phantasy." Almost a century ago Henry Thomas Buckle wrote in his *History of Civilization in England:*

> Whoever is at all acquainted with what has been done during the last two centuries, must be aware that every generation demonstrates some events to be regular and predictable which the preceding generation has declared to be irregular and unpredictable. . . . This being the case, it follows that if any facts, or class of facts, have not yet been reduced to order, we so far from pronouncing them to be irreducible, should rather be guided by our experience of the past, and should admit the probability that what we now call inexplicable will at some future time be explained [9, p. ix].

Indeed, one need but note fairly recent reports of experiments and studies which suggest that disbelief in this regard may imply wilful blindness. The *New York Times*, for example, has carried the following articles: "Radio Waves Found To Affect Cell Behavior," March 30, 1959; "Geophysical Effects on Growth Reported Traced by Biologist," April 17, 1959; "Some Radio Waves Kill When Aimed at Monkey Brain," April 25, 1959; and "Ions in the Air Found To Affect Health," June 8, 1959.

Endless speculation, needless to say, is suggested by the foregoing. The author finds possible correlations between climatic phenomena and the "social physics" of Stewart and Warntz particularly intriguing, as also the Freudian concept of "cathexis" and Franz Alexander's principle of "surplus energy"—the correlations operating via the

[4] As Professor Sprout (personal discussion) points out, there are at least three variables and related conditions to be considered here: (1) the climatic agents; (2) the human agents; and (3) such "intermediate" agents as micro-organisms, food crops, etc. The climatic agents act directly on the humans or indirectly through the intermediate agents. And the direct and indirect effects may be consciously apprehended by man, or they may operate autonomically, though, of course, the direct and indirect processes differ in the two cases. (It should be apparent that, up to this point, I have concerned myself primarily with the conscious, direct effects and only to a lesser extent with the conscious, indirect effects.)

interaction among physics, chemistry, biology, psychology, and sociology.

Not speculative, however, are the correlations which have been established between climate and human vigor; and though, as Bates and Spate remind us, activity can be confused with achievement, the evidence has been that the general level of industrial production and intellectual and social achievements are highest in climates and seasons where the "optimum" conditions prevail and that the general level of such achievement appears to be definitely favored by the stimulus of moderate variations toward the colder side of the optimum range. (For example, as noted earlier, it has been established that there is general improvement in crops and animals toward the colder part of their range.)

The foregoing indicates that cultural achievements have not so completely replaced "natural selection" in human history as Markham has asserted. This is not to say that we ought to conceive of the relationship of man and climate as that of the relatively simple (?) one between climate and other fauna (or the flora), especially in view of the manifest occurrence of a wide range of variations in effect upon individual human beings. Perhaps the implication is that "natural selection" can never be replaced by human culture in the ultimate sense of man's organic position in nature. Clearly, what the work of Huntington and the others have in common, despite their many differences in orientation and detail, is the implication of a general unity underlying all organic (including human) and inorganic activity in the universe.

But, as mentioned previously, it has become apparent that, while man's knowledge of his natural environment and of himself has served many necessary and useful purposes, it seems to have "alienated" him progressively from the world of which he is a part. (By some weird turn of history, technology appears to have become man's master rather than his instrument. And thereby, *work*, for example, which Freud said was a chief means of binding man to reality, is becoming quite meaningless in many areas.)

Unfortunately, there seems to be little chance at present of closing or even arresting the widening gap in man's understanding, even should such airy speculations as those hazarded above eventually be verified scientifically.

This consideration is indeed a strange and mysterious one, for, surely, all the fascinating discoveries of science and the frenzied achievements of technology ought to have made clear that man is indeed but part of something greater—"the factor in nature which," as Whitehead said, "exhibits in its most intense form the plasticity of nature." (Truly, we ought marvel, for example, at our "fantastic" electronic computers and the like. But ought we forget that they are but the products of man's brain? For what reasons does man employ his brain in the construction of such instruments except but to deal with the natural forces by which he is encompassed?)

Reflection on the literature reviewed here leads to a conclusion (and hope) which is perhaps obvious: that awareness of the intimate bond of all men in their common relationship with their natural environment offers a countervailing force to the arrogance which derives from increasing control over aspects of that environment and offers also a hope of kindling humility and an understanding which will act toward the easing of tensions and toward co-operation in local and world-wide relations. As Harrison Brown has put it: "A prerequisite for the preservation of the canons of humanism is a re-establishment of organic roots with our natural environment" (17, p. 257).

> This curious world which we inhabit is more wonderful than it is convenient; more beautiful than it is useful; it is more to be admired and enjoyed than used.
>
> HENRY DAVID THOREAU

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Economic conflicts in South Asia

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The issues raised in this paper are common to, and indeed help to define, the area of study: the Indian subcontinent, the Indo-Chinese peninsula, and insular Southeast Asia. Many of these issues are also common, with progressively increasing degrees of difference, to most of the "non-Western" and "economically underdeveloped" world, as those terms are generally understood. This paper will attempt to explore certain well-known attitudes which are both causally and coincidentally related to the factors inherent in "non-Western" and "economically underdeveloped" but will confine itself primarily to issues which are distinctively South Asian and which hinge upon the interaction between Asia and the West. It is not surprising that this interaction has generated a variety of conflicts and that conflicts have also developed from the interaction of the industrialized or "developed" economies of the West with the "underdeveloped" economies of Asia. Conflicts are apparent in the attitudes of Asians as they have attempted to re-evaluate their own traditions and economic systems and as they have developed ambitions, derived in many cases from Western models, which are at odds with their own circumstances. The attitudes considered here are those of the relatively small group of intelligentsia who control or influence national policy and who record their views.

South Asia has only recently emerged from the political forms of colonial empire. Although national independence in much of the area (with the exceptions of India and the Philippines) was hastened, if not occasioned, by World War II, there was relatively little overt or armed force employed specifically to create political independence outside of Viet Nam and, to a lesser extent, Indonesia. Colonial control was ended by negotiation and, at least in the case of the former British and American colonial holdings, was ended with more satisfaction than regret on the part of the former colonial powers. But national independence in political terms has not put an end to what most politically conscious South Asians regard as colonial elements in their societies and economies. There is a nearly universal conviction that such surviving colonial elements must be uprooted and expelled if national independence is to be genine. They include such things as the persistence of European language among intellectuals and civil servants, the wearing of Western dress, the use of Western art forms, and the continued existence of essentially Western social institutions and value systems.[2] Economic sur-

[1] I am indebted to M. B. Jansen, M. D. Morris, and E. L. Ullman for helpful comments on the draft manuscript, but they are, of course, not to be held responsible for anything in this paper.

[2] Some of the South Asian intellectuals have not been uncritical apologists for their indigenous cultures, and some have adopted a Marxist

vivals of the earlier colonial pattern are probably, however, the most vigorous, the most deeply resented, and the most difficult to uproot.

Attempting to deal with this economic problem involves the South Asian intelligentsia in a far-reaching series of conflicts (3, 9). At worst, the conflicts threaten to destroy the economic base on which viable national independence must rest, or so to befog and pervert planning and development that the economy stagnates or deteriorates. At best, they hamper rational decision-making and action on a critical economic problem. All the countries of South Asia have low real incomes per capita and low per capita productivity by comparison with the West, dangerously low for the reasonable maintenance of life and health, and immediately threatened by population increases. Siam and Malaya are relatively better off, but the South Asian average is not much affected by them. A century or even a generation ago, these same levels would not have seemed low to many South Asians. They seem low now because South Asia has had intimate experience with the modern West as part of Western colonial empires and has more recently observed through Western media what Western levels of living have become since the eighteenth century. "Underdeveloped" is a relative word, coined and applied by the West to indicate something below the Western standard, and it is interpreted exactly in that way by non-Westerners.

Consciously or unconsciously, high per capita incomes are frequently associated in the Asian mind with national independence and low incomes with colonial status. National independence has been attained, but levels of living remain low in South Asia. Increases in per capita income and productivity could be accelerated by the use not only of techniques developed in the West but, at least in the early stages, of some Western technicians, entrepreneurs, and capital. Conflict arises out of the fact that economic growth, especially of the sort wanted, involves the continued use of what are considered to be undesirable alien men, money, and markets. "The positive theme that Ceylon [for which read "South Asia"] shall become secure and prosperous is closely joined with the negative theme that imperialists and colonialists shall not keep this from happening" (12, p. 26). Conflict also arises out of the disharmony between new national ambitions or preferences, on the one hand, and, on the other hand, the realities of the South Asian resource base and of the economic structures which have been built on it. "The people [of Asia] insist on two basic things. The first is the right to rule their own destinies. The second is to improve their economic well-being" (1). South Asians want an industrialized, self-sufficient, prosperous, and independent economy which generates, or at least controls, its own investment capital, provides its own entrepreneurs and technicians, and whose fortunes are not dependent to any controlling extent either on foreign investment or on foreign markets and business decisions. We may take these points in order. None of them corresponds closely to the resource and economic realities of the present or the foreseeable future, and several are contradictory.

Industrialization

We understand too little about the nature and dynamics of economic growth to permit dogmatism. The example of Japan is at hand to confound those who argue that

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frame of reference in criticizing them; others have more single-mindedly welcomed the spread of Western models. See the semi-autobiographical essay by the Indonesian Socialist Soetan Sjahrir (13).

plentiful domestic mineral resources are essential to industrialization. This should be borne in mind in reading what follows, which is based on present knowledge but which could well be upset by events of the next decade or half-century.

With the possible exception of India, the general resource base of South Asia appears inadequate to support extensive heavy industrialization of the magnitude desired. Light manufacturing and consumer goods production is generally not the most important aspect of South Asia's industrial ambitions, and its development would still leave South Asia psychologically unsatisfied. There are rational bases for some heavy industrial development, especially in Indonesia, Pakistan, and India. For the smaller countries, of which South Asia is mainly composed, even light manufacturing and consumer goods production are economically rational only on a small scale, because the national markets are too small to justify or support such production on a large scale in competition with low-cost production in Japan, India, and elsewhere. The shortages or absence of adequate cheap domestic fuel and power, other raw materials, skilled labor, capital, and machine industry, however, limit both heavy industrial development and light manufacturing. Economic rationality may be less important a factor in industrialization than national will or than mobilization and control by national governments. But the conflict between ambitions and reality contributes importantly to economic planning, where effects, in the misuse of scarce investment funds, can be disastrous.

Examples may be drawn from industrialization plans in nearly every South Asian country, which range from large integrated iron and steel mills in the absence of adequate domestic fuel and ore, to atomic reactors, to pharmaceutical plants, and to textile industries designed to satisfy the total domestic demand (usually behind a high tariff wall), even though raw cotton and textile machinery may have to be largely or entirely imported. A striking case of comparative industrial costs is the manufacture of rubber tires in Ceylon. Ceylon is an important commercial producer of natural rubber, but, in a country which lacks in adequate amounts most or all of the other factors necessary for tire manufacture, the cost of making tires would be appreciably higher than in America or Britain, to which Ceylon exports rubber and from which Ceylon purchases tires. Domestic planners in South Asia argue that almost any sort of production, even at higher cost, must be encouraged in order to provide employment; that it may be better to subsidize high-cost production than to suffer or subsidize massive unemployment as population mounts; and that placing orders overseas when there is a domestic breadline seems unreasonable. But, despite its political attractions, such an argument carried to its logical conclusion would result in magnified losses. There is a good case for subsidizing some marginally efficient production, but, unfortunately, the economic alternatives open to most South Asian countries are limited, as discussed in greater detail below.

The economies of scale and the occurrence pattern of industrial raw materials, as well as some perhaps less permanent shortcomings, are against the industrial ambitions of most South Asian countries. Objectively, the limitations imposed by small national markets could be removed by merging the separate national units, at least economically. Western Europe, where national units are also relatively small, is beginning to do this, but the present vigor of new nationalisms in South Asia would appear to rule out such a solution, at least for the immediate future. Apart from the

psychological dissatisfaction resulting from the absence or failure of significant industrial development in these countries, there is the further point, of which many South Asians are aware, that without a reasonably well-developed heavy industrial base it is difficult for an economy to develop a healthy situation of light industry and general economic growth, quite apart from the undesirable overtones of continuing dependence on Western industrialized economies for the supply of capital equipment and consumer goods.

On a different plane there are deep contradictions, often in the minds of single individuals, over the very desirability of industrialization. Industrialization may be viewed as a source of national prestige, strength, and economic growth, but it may also be viewed as disruptive to traditional or indigenous institutions. Industrialization not only destroys traditional social, cultural, and economic institutions, but, to be successful, it must establish a whole new set of institutions which are amenable or stimulating to the industrialization process. To the Asian mind, many of these institutions are Western, alien, and undesirable. The traditional family system, the role of the individual, the pattern of rewards and restraints, the system and concept of law, the traditional standard of values, and the avenues to worldly success must all be changed or replaced by their counterparts of an industrial-commercial society, from what sociologists call "functional specificity," to the impersonality of codified law, the market system, and the planning board (6). Hesitation or vacillation is understandable when confronted with industrialization as prestige and power, and industrialization as disruption and destruction. Westerners may sympathize, but in the West the choice, if it was a choice, was made a century or more ago. The disrupting effects of industrialization no longer exercise the Western mind as powerfully as they do in South Asia, where much of the traditional culture and economy is still intact and where perhaps the most vigorous aspect of new nationalism is the defense and encouragement of what are felt to be genuinely indigenous elements against the frontal attack and various encroachments of Western influence.

It is apparently not an adequate solution to South Asians to regard industrialization as culturally non-specific, to consider that it has no necessary or identifying connection with the West. Although this may objectively be true, industrialization is identified with the West despite the efforts of many Asian intellectuals, scientists, and entrepreneurs; where the idea of industrialization spreads, it tends to stimulate, at least in its early stages, the contradictory growth of industrial ambitions and rejections.

Especially where the traditional culture is a highly developed one with great prestige and self-conscious accomplishments, it will be defended against devastating inroads such as industrialization brings. The long nineteenth- and twentieth-century agony of the Chinese intellectuals in fighting this unequal struggle is a prominent example. They ultimately failed in their attempt to departicularize industrialization, and the whole fabric of the traditional society was torn apart by what no semanticist or philosopher, however artful, could continue to label as a self-contained Chinese adaptation of a few materialist barbarian tricks. It was remarkable but useless whistling in the dark to argue that ancient Chinese sages had discovered all these things long ago and that China was merely following her own traditions in building factories or machine guns; or that the secret of strength in resisting the West was to be found in the wisdom and civilization of the former Han dynasty (206 B.C.–A.D. 24); or that

great China could condescend to borrow a few utilitarian gadgets from foreigners while retaining her own moral and institutional identity and self-respect (4, 8).[3] Indian attitudes made explicit by Gandhi and many of his contemporary followers—the symbolic spinning and wearing of homespun cloth, cultivation of essentially anti-industrial and antimaterial philosophies, detailed governmental attention to preserving traditional crafts and home industries—have their many parallels in every South Asian country to differing degrees (5). And they are matched in every country by extensive planning and investment in what we may call "modern" industrialization and economic institutions.

It is argued that preserving or even expanding handicraft industries is rational, at least in the short run, because this provides immediate employment, which is pressingly needed, with a minimal outlay of capital and without depending on new labor skills, machine industry, or the disengagement of labor from the rural agricultural context. The agricultural economy is also frequently characterized by slack periods during which rural labor might be used even for marginally efficient handicraft production. But, aside from artisan-type craft production of art goods or the minor arts, it is difficult to see a significant economic place for handicraft production on a permanent basis in any industrial economy. Handicraft production may wither away with the advent of large-scale industrialization, as the Indian planners sometimes suggest, but it seems clear that conscious planning for its preservation is based as much on ideological as on economic grounds. Slack rural labor would be better employed in such agricultural capital construction as land reclamation, irrigation extension, or improvements in storage and marketing facilities. To plan at the same time for expanded handicraft production and for "modern" industrialization is to follow opposing roads. The two are fundamentally incompatible (15).

Self-sufficiency and Economic Independence

None of the countries of South Asia, including India, should attempt or can hope to achieve the extent of economic self-sufficiency and independence which they ideally desire. No national economy, however large or richly endowed, can maximize its own economic welfare by attempting to be self-sufficient, a truism which is perennially indigestible wherever feelings of nationalism run high, as they understandably do in the newly independent and newly nationalistic countries of South Asia. These countries are in a particularly awkward economic position from which to pursue even a moderate degree of self-sufficiency. To begin with, only Burma, Siam, and possibly India are consistently able to feed themselves or can reasonably expect to do so in the foreseeable future. The others must depend, to varying and probably increasing degrees, on food imports. It is equally clear that none of these countries, including India, can even anticipate the time when they might be free of the need to import many if not most of the raw materials and capital equipment required for industrialization and transport or, alternatively, of the finished goods wanted for consumption. To import, an economy must export. To do both, an economy must be dependent on economies elsewhere. In the case of South Asia the degree of dependence must remain high, unless self-destructive planning is followed. As will be examined in greater detail below, most of South Asia is best fitted by its resource complex to produce food and industrial raw

[3] For a summary account of the similar intellectual struggle in modern Turkey see Matossian (9).

materials. Production and sale of these commodities are likely to remain the predominant sources of foreign exchange for the purchase of goods and services which South Asia cannot economically produce.

The necessarily large-scale, manifold relations with Western industrial economies which this situation leads to are rational and profitable from South Asia's point of view, but they substantially condition the self-sufficiency and economic independence which South Asians want unconditionally. Such relations tend to perpetuate circumstances which South Asians associate with colonialism by keeping them in the economic role of suppliers of primary products and industrial raw materials to a Western market which continues to retain the lion's share of industrial production. India has prospects of escaping to a considerable extent from these circumstances as industrialization proceeds within a reasonably well-endowed resource base and an immense national market. For the other South Asian countries there are few immediate prospects of economic growth which could substantially alter these circumstances. The fact that primary production (agriculture, mining, lumbering) can be and often is highly profitable (e.g., in Montana, Iowa, Denmark, or New Zealand), that an economy so organized can be as prosperous or create as high per capita incomes as a predominently industrialized economy, or that for most of South Asia increased investment in primary production is more beneficial than increased investment in heavy manufacturing apparently do not resolve the conflicts and frustrations which many South Asians feel over what they regard as survivals of colonial economic patterns. They do not want autarky but would like to have the independence which they believe would result from becoming mainly exporters of industrial goods. The chances for this do not appear promising.

Prosperity—Higher Per Capita Incomes

Income growth is an especially complex matter which cannot be dealt with here except in generalities. The concept of per capita income is notoriously difficult to make precise, especially for subsistence economies. Dollar figures are at best arbitrary, are usually misleadingly low for subsistence economies, and are often meaningless. There is probably no better single measure of individual economic welfare, especially when it is viewed as a measure of per capita consumption also, but its usefulness is necessarily limited (10, 11). In South Asia, ambiguity and inaccuracy are worsened not only by the prevalence of subsistence production, the lack of adequate data, and the importance of non-monetary rewards and co-operative assistance but also by the gross fluctuations in national income figures which result from inflation and deflation, changes in conversion rates, and variation in the prices received for primary exports. It should be stated, however, that real per capita incomes in South Asia, as far as they can be measured and adjusted, either are more or less static as of the period since independence or are rising very slowly. In some areas or countries there may have been a slight decline in per capita incomes since independence; this seems likely in Indonesia, Viet Nam, and Pakistan and quite possible in Burma. On this crucial point national ambitions are thus also in conflict with reality.

The problem is worsened by the demographic situation. An annual population growth rate of 2 per cent, which is probably not far from the South Asian average, makes the bootstrap type of economic

growth even more difficult, and that is essentially the type of economic growth on which South Asia must depend, especially if reliance on outside capital and other assistance is minimized, as South Asians ideally would prefer. To extend the analogy, a man who continues to add to his weight finds it increasingly difficult to lift himself—by his bootstraps or by any other method. Most demographers agree that South Asia as a whole is still in the early stages of a more or less inevitable population increase which may leave the total population two or three times its present size. The prospects for increasing total production by an equivalent amount and over an equivalent period are, to say the least, uncertain, in terms of presently known resources. Equivalent increases in production would leave per capita incomes at their present low levels. Given South Asia's relatively limited resource base and present technological state, a rise in real per capita incomes to approach Western levels, which is what South Asians now want and which is the nub of the problem of "underdevelopment," seems more unlikely than likely (2).

"Underdevelopment" is a relative notion, and it is unpleasantly true that the West as a whole has a much higher economic growth rate, including per capita incomes, than the non-Western world. The gap, which first began to open in this sense perhaps a hundred and fifty years ago, is continually widening. With ten or fifteen times their present real per capita incomes, the countries of South Asia fifty years from now would probably still be "underdeveloped" economically by comparison with the West at that time. Admittedly, fifty years is a long time, and many presently valid assumptions and apparently firm conditions may no longer apply before the end of that time. The point here is that what we presently know suggests that most of the "underdeveloped world" will remain behind the West in per capita incomes and national economic power for the foreseeable future and that, relative to the West, it is likely to lose ground.

Such a development would be even more psychologically disturbing to South Asians than the failure of significant heavy industrialization and would have dangerous repercussions internationally. Logically, there would seem to be a persuasive argument for abandoning attempts to measure non-Western economic development by Western standards. Especially in South Asia, where Western models generally are considered undesirable (as well as desirable), it should be attractive to use indigenous standards (as the Chinese Communists do to a considerable extent). Japan's economic development has produced a per capita income which is still small by Western standards, but this is definitely success in Asian terms. When economic development acquires momentum and people become involved in it, original or unrealistic goals are often lost sight of, and any substantive economic gains are accepted gratefully; sometimes the promise of such gains is enough in the exciting context of a national effort. China and Russia, among others, provide examples. Such a reorientation of attitudes in South Asia now might help to ease the conflict which is basically present. South Asia admires and rejects the West, wants to emulate and wants to differ from it. It can do neither satisfactorily, and, in trying to do both, it threatens to worsen its economic dilemma as well as its intellectual disturbment.

Generation and Control of Capital, Entrepreneurs, and Technicians

This is also a complex matter which cannot be treated here except superficially. In

South Asia, as in any economically "underdeveloped" area almost by definition, capital accumulation is difficult and limited, and the most promising source of foreign exchange is the export of industrial raw materials to the industrial West. The prospects for increasing domestic capital generation and accumulation are essentially the same as for the general economic growth of which capital accumulation is a vital part. Population increases and the obstacles to industrialization becloud these prospects. Primary production can, as mentioned above, be as profitable as industrial production, even in commercial terms. But it is obvious that profits from primary production are most effective in terms of general economic growth when the total size of the population is relatively small and when the bulk of the labor force is engaged in commercial rather than subsistence production. Areas of commercial primary production are usually relatively sparsely populated, and the land and other resources are used extensively rather than intensively, as is necessary in most of crowded South Asia. Extensive labor and intensive capital operations are characteristic of commercially successful primary production, as in the cases of Iowa, Montana, Denmark, and New Zealand cited above.

For example, profits from mining and commercial agriculture in Montana and in Indonesia are large in total, but in relation to total population and labor force Montana's capital accumulation is substantial, while in Indonesia, with approximately ninety million people, most of whom are subsistence farmers, the per capita total of capital accumulation from commercial agriculture and mining is small (7). The same problem of size bedevils all other aspects of economic growth and possible sources of capital accumulation. What surplus capital may exist in subsistence economies is commonly invested in the ownership, but seldom in the improvement, of land, or in moneylending at high interest—essentially non-productive and non-renewing uses of capital. (Some South Asian capital did go into trade, but its proportional amount was small, and, as will be noted below, Chinese and other foreigners tended to dominate trade and finance in South Asia.)

An economy must continually generate new capital surpluses if it is to sustain growth. In the seventeenth century India and China had more liquid assets in private and public hands than England, but they did not experience the amazing acceleration in the rate of capital accumulation which took place in Britain. One of the factors was an already dense and rapidly increasing population in Asia. But this is not the place to consider the variety of factors involved in economic growth or commercialization. The above points are mentioned only to emphasize the relatively small scale of capital accumulation in South Asia, to hint at the obstacles in the way of increasing it, and thus to throw into relief the role which foreign capital investment could play in stimulating economic growth. This does not mean that foreign capital, even in greatly increased amounts, could necessarily produce substantial or rapid economic growth in South Asia but only that South Asia cannot for some time expect to generate domestic capital surpluses in adequate amounts. The great bulk of development capital must be raised domestically. Foreign capital can merely ease the pinch and thus perhaps reduce somewhat the problem of non-totalitarian governments which are unwilling or unable to squeeze capital surpluses out of current production to the extent that this is done, for example, in China.

If foreign capital is to be used, the question of control arises almost instinctively and spontaneously in South Asia, since the

predominant sources of investment capital are the former colonial powers. The understandable but contradictory reaction of most South Asian countries is to welcome foreign capital and commercial enterprises and yet to warn against them and demand crippling restrictions. Wanting but not wanting is too common and disturbing a conflict, for individuals as well as nations, to encourage any Westerner to be supercilious about the dilemma of South Asians. But in purely practical economic terms, to hamstring the entry and operations of foreign capital threatens to retard the economic growth which is so important to South Asia both materially and ideologically, especially if domestic resources are not to be squeezed further.

One solution is to have all foreign capital given or loaned to the national governments; these would then control its use and decide on its investment. But Western governments are notoriously less willing than private Western enterprises to give or lend money, particularly if it is without strings, to invest in enlarging the commercial sector of "underdeveloped" economies, even under favorable business conditions. Most South Asian governments are well aware of this, but there is often an element of distrust or conditional enthusiasm about even grants or loans without strings from foreign governments; strings may in fact become apparent later. Outside governments, especially the great powers, are not always trusted by recently independent former colonies, and there may be overtones of charity and a qualified independence attached to foreign government aid which South Asians resent. There are notable exceptions, of which the Colombo Plan is an outstanding example, but the funds which they make available are very small.

The more promising sources of private foreign capital are frequently still more distrusted or resented, partly for the above reasons, by association, but more because of the control question. Theoretically, foreign capital investments could be integrated under domestic authority into the national economic planning, but this is seldom what the foreign investors want. Their judgment of promising investment opportunities cannot be expected to coincide with the judgment of national planning boards. Foreign investors are often more interested in primary production, with an eye to profits, than in the industrial production which South Asian countries want. It is also disturbing to South Asians to see a large share of commercial investment capital, commercial enterprises, and profits accruing from them, in foreign hands. It looks too much like continued colonialism.

Attempts at solutions, many of an *ad hoc* nature, include more or less rigid import and export controls, currency-exchange controls, punitive tariffs, prohibition of foreign capital in certain sectors or certain types of enterprises, heavy to ruinous taxation of foreign enterprises, threats of nationalization, unreasonable regulations specifically designed to irritate and discourage foreign enterprises, and requirements that half or more of the voting stock, board of directors, and employees in all commercial enterprises be domestic. These policies are accompanied by official and unofficial attitudes toward foreign investors and business enterprises which range from explicit antagonism to lukewarm cordiality. It is not surprising that few present or prospective Western investors find the business climate in South Asia notably attractive (there are some exceptions) or that many have cut their losses and withdrawn. Indonesia, where bitterness against the former colonial power still exists in a way and to a degree unknown in the rest of South Asia, has gone to an extreme, especially since 1956, by expropriating large Dutch holdings, particularly in ship-

ping, and by hampering much of the rest of the very extensive Dutch-owned enterprises to the point of financial ruin. In October, 1958, all Nationalist Chinese enterprises in Indonesia were unilaterally nationalized by the Indonesian government. These experiences are not encouraging to other foreign capital and for the present, at least, also leave Indonesia dangerously weakened economically. Elsewhere in South Asia there may be grounds for thinking that national governments are more successfully attempting to swallow their various deep-founded objections to foreign capital and enterprises and to create conditions which can be at least minimally attractive to outsiders in business terms. But the basic conflict remains.

What applies to investment capital applies almost equally to entrepreneurs. The situation varies from country to country, but South Asia as a whole has only a tiny indigenous entrepreneurial group of the sort required for the management of large commercial or industrial enterprises. One is tempted to say "of Western-type enterprises," a temptation which reveals what is at least generally considered to be the Western origin and nature of most large commercial activities of the past two centuries, and of those which are felt to be needed in South Asia, as in all of the "underdeveloped world." Traditional moneylenders and small shopkeepers do not necessarily make effective entrepreneurs in this sense. South Asia is like most primarily subsistence economies in lacking a well-developed entrepreneurial group, but with the difference that entrepreneurial functions were until very recently performed predominantly by foreigners—at the top of the scale by Westerners and elsewhere by Chinese or by emigré groups of South Indian Tamils. The Chinese and Tamil entrepreneurs in South Asia constitute a separate problem which cannot be discussed here despite its great importance; this paper is concerned primarily with Asian-Western conflicts. South Asia's continued dependence on foreign entrepreneurs includes not only individual entrepreneurial skills but whole corporate structures and institutions, from primary, secondary, and tertiary production to transport, foreign trade, and finance. Indigenous entrepreneurial groups are growing rapidly, but it will be a long time before they can effectively replace foreigners, and they can do so at all only by following Western models which South Asia would like to reject.

What is true of entrepreneurs is also true of technicians, although the problem is less disturbing in the sense that technical and scientific skills can more easily be culturally departicularized, probably more quickly learned or transferred, and more readily related to the traditional culture (e.g., in India) than can large-scale commercial entrepreneurial skills. But, for some time to come, South Asia will have to make use of Western geologists, engineers, chemists, or agricultural technicians if economic growth is to be maximized. Skilled industrial labor is, of course, critically short in South Asia, but it has never been supplied significantly from the West. Conflict in this case arises out of the fact that, to develop an adequate pool of skilled labor, South Asia must rely heavily on direct Western training and on Western models.

Independence of Foreign Markets and Business Decisions

The resource base of South Asia as a whole—scattered rich deposits of tin, petroleum, and possibly bauxite (aluminum ore); large areas of soils relatively fertile for tropical climates; the permissive tropical climate; extensive areas well suited to growing rubber, tea, jute, cotton, hemp, sisal, tobacco, sugar cane, kapok, spices, fruits, com-

mercial hardwoods, and other tropical or semitropical crops; a major ocean route and with most of the chief productive areas close to the sea; general absence of significant amounts of coal and iron ore (aside from India); and relatively small potential for economic hydroelectric power development (again aside from India)—collectively lends itself to the development of an essentially extractive economy with the products of mining and plantation agriculture going primarily to Western industrial markets in the absence of a large domestic market and with the availability of cheap ocean transport to Europe and the Americas.

This situation is disturbing enough for South Asia as a whole as it is seen to condition economic independence, but for most of the individual countries it is worse in the sense that their export trade is dominated by only two or three staples sold almost exclusively in Western markets. Over 90 per cent of Ceylon's export trade by value is in tea, rubber, and coconut products. Well over half of Malaya's exports are rubber and tin. For the Philippines, coconut products, sugar, and hemp compose over three-quarters of total exports. Rice alone is about three-quarters of Burma's export trade and is about two-thirds of Siam's. Rice and rubber comprise about three-quarters of the total exports of North and South Viet Nam taken as a unit. Indonesia, with a larger areal base, has a somewhat more diversified export trade, but rubber alone is about one-third of Indonesia's exports, petroleum products about one-fifth, and tin about one-tenth. India's exports by value are over 30 per cent jute and jute products and over 10 per cent tea. Over half of Pakistan's exports is raw cotton, and about a third is raw jute.

None of these national economies can afford to talk about independence from industrialized foreign markets and business decisions, even though the markets and decisions are almost entirely Western and include the former colonial powers. South Asians understandably view their economies as dangerously unbalanced, while they remain dependent on the sale of two or three commodities in markets which they cannot control and whose vacillating fortunes, controlled by foreign buyers, are virtually equivalent to the economic fortunes of South Asia. The terms of trade, which South Asia cannot strongly influence, fluctuate widely. For example, the decline in raw-material prices during 1957 and 1958, plus rising prices for most capital and consumer goods, cost most South Asian countries about the same amount as they received in foreign aid during the same period. It is unsettling to have the feasibility of essential imports dependent on the London price for rubber, tea, or tin. But the economic risks of attempting to diversify exports or to reduce trade with the industrial West are much greater. Unfortunately, the opportunities for profitable diversification appear relatively limited—increases in commercial lumbering, commercial fruit-growing (especially pineapples and bananas), commercial fishing, and a few other less important possibilities. None seems potentially or proportionately very large, and all face well-established competition from other areas.

The structures of mines and plantations and the production of industrial raw materials which now dominate the commercial economy of South Asia were indeed established by the Western colonial powers, but their economic rationale has not changed since independence; it has grown stronger, especially when one considers alternative lines of production, alternative uses of capital investment, booming populations, and the necessity to import a large proportion of food and the consumer and capital goods required. It is often argued that land taken for plantations might better be used to grow

food for the domestic market and thus save imports. Actually, this is not usually the case, since much if not most plantation land is not well suited to food crops. Even if the land were suitable, it would in most cases be more profitable to grow commercial crops for export and to buy food with the proceeds than to substitute food crops for the rubber or copra which keep the economy afloat and in which South Asia has an advantage not matched by any alternative use of resources, capital, or labor. South Asia is obliged to choose between making the best of the nagging insecurities of a widely fluctuating Western demand and price for what it offers, plus the continual and growing spectre of substitutes and synthetics, or the certain, serious, and immediate economic losses which would result from attempting to substantially diversify or restrict its foreign trade. Given the prevailing South Asian attitudes toward the West and toward the problems of economic development, it is understandable that this choice is not an easy one and that in many cases it is sidestepped by attempting to pursue both courses, contradictory though they may be.

Conclusion

Economically as well as more generally, the political end of colonialism in South Asia has left a continuing set of conflicts. If South Asia were a different kind of place intellectually or politically, these conflicts would not be as cancerous as they appear, especially through Western eyes. But (with the possible exceptions of Burma, Siam, and the Philippines) there is little of the *dolce far niente* in South Asia such as may be found, for example, in certain parts of Latin America. South Asians are generally intense, more so all the time, about their intellectual, cultural, social, and economic problems as they see them and in economic terms especially are moved by vigorous convictions and vigorously sustained ambitions. This may be due in part to the relative newness of nationalism and independence in South Asia and in part to the long and recent history of colonial control in the area. But, whatever the reasons, most of the South Asian intelligentsia cannot rest easy with its conflicts and finds it difficult or impossible to resolve them. The intellectuals' very awareness of the issues which concern them, their intensity, their feelings of nationalism, the terms they use, and the ideas which form their mental furniture are essentially Western, and this in itself is basically disturbing. There are, of course, new or indigenous elements of great strength in South Asian nationalism, and in time a new generation nurtured in a new nationalist tradition under independence will escape to some extent from the psychological or intellectual dilemma of the present groups. But political independence in South Asia is scarcely a decade old. For the present generation, and probably for at least the next generation, an examination of realities against the backdrop of ambitions may lead to the despairing cry, "Alors, je ne serai jamais un homme libre?" (14).

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Problems of partition and segregation in Northern Ireland

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Boundaries of all kinds tend to arise from, and give rise to, conflict. For no boundary was yet devised which did not militate against some aspect or other of the life of the communities through which it was drawn. The geographer can sympathize in this respect with the kind of dilemma facing the statesman, for he, too, when delimiting regions, is up against insuperable problems. He is the more fortunate in one respect, however, for his problems are merely methodological. The geographer's boundaries are abstract concepts which will not interfere with human life and action; indeed, he can, and sometimes does, fight shy of the whole problem of delimiting boundaries by merely describing the "personality" of a region. The statesman begins by having to delimit a line on a map, but he has to go further; his line must be translated into fact, it must be demarcated, and thereafter it has an immediate impact on the lives of those on either side of the line.

Yet surely there is a meeting point for the geographer and the student of human and political affairs. There is no reason why geographers should be content with abstract regions or with those which are related almost entirely to features of the earth's surface. And it is patently obvious that the political and strategic boundaries of statesmen pay insufficient attention to fundamental human geographical facts. A tentative essay into more rational boundaries was made after World War I, when ethnogeographical factors were given at least lip service. But, in fact, even when social factors were taken into account, it usually meant the simplification of a very complicated problem. Those who make boundaries are little concerned with the cultural details which mean so much to the individuals whose lives are being altered. All the ingredients of conflict are often created in the very act of trying to abolish conflict.

In the analysis of the human situation which arises in the political sorting-out of people, as when a boundary is drawn, the human geographer's approach and techniques make a contribution. The problems involve spatial relations, the distributions of groups of peoples, and their activities and attitudes. While the geographer makes no claim that there is a causal relationship between such distributions and the features of the earth's surface, his techniques need not be ignored or the analysis of the interrelationships revealed by these techniques. It is often a geographical analysis which throws into relief the total inadequacies of boundaries which have been chosen strategically or politically, and it needs little stressing that the kind of information in which the human geographer is interested would illu-

mine very considerably some of the problems and conflicts which arise. These notes are intended to be no more than indicators to the kind of work which lies open in this field to geographers, in relation both to boundaries and to the voluntary segregation of human groups arising from conflict in a city community.

Rural Partition

A thorough geopolitical study of the boundary between Northern Ireland and Ireland still remains to be done, but a few minor studies are sufficient to indicate the problems which arise. Northern Ireland as a state was the result of the partition of Ireland in 1920. Dissatisfaction with the union with Britain had fostered nationalist and republican movements in Ireland in the later nineteenth century and ultimately led to the Home Rule Bill of 1912. But this gave rise to violent reactions in Ulster, where large numbers of Protestants bitterly opposed home rule and stuck out for union with Britain. It was a three-cornered fight, therefore, which was coming to a climax when World War I began. The greater conflict delayed the lesser by only two years, for the nationalist elements, dismayed at the suspension of laws and the delaying tactics of Westminster, engineered an insurrection in 1916. The result with which we are concerned was the creation of Northern Ireland, composed of the six counties of the eight of historic Ulster, which had an overall majority of Protestants, though the local variations in the ratio of Catholics and Protestants within this area were very great.

The treaty of December, 1921, had in it a clause for the revision of the boundary, which was no more than the boundaries of those counties which were contiguous with the new Free State, and political opinion in the Free State was that in a new settlement counties Fermanagh and Tyrone, as well as much of counties Armagh and Down, would be transferred. In terms of numbers the ratio of Protestants to Catholics in these areas of the north was delicate, but property ownership and social influence certainly gave the Protestants the advantage. Negotiations failed, and in 1925 the Free State accepted the boundary as it was in return for substantial financial concessions from Britain.

The boundary was arbitrary in two senses. In the first place, it was the result of dealing with a bloc of counties and of accepting a final agreement for financial concessions. Second, as a consequence of this, both sides accepted county boundaries which bore no relevance to the issue and which brought with them serious difficulties in detail. Disruption and tension arose not only along the boundary but wherever minority groups were exclusive and fairly numerous, in the more western and southern rural districts, in larger towns, and particularly in the new capital, Belfast. The tensions have not been entirely dispelled in the last thirty years, and changes are constantly going on.

A boundary based on the historic counties is arbitrary because it ignores some of the fundamental facts of the human geography of the region. It is certain that the overwhelmingly important human feature, which would have constituted even an anthropogeographical boundary, was, and is, religion. Again, it is not unwittingly that a contemporary handbook exactly equated differences in political aims with religious differences (5). Consequently, it is worth examining the ratio of Protestants to Catholics in Northern Ireland today. In Figure 1, showing the distribution of Catholics in 1951 (1), there is a sharp contrast between the west and the east. The 50 per cent line splits the province in two, with a Catholic majority in the west, in south county Ar-

magh, and in south county Down. There tends to be a sharp break from 50 to 59 per cent on one side of Lough Neagh to under 25 per cent on the other. The important features of the figure are these:

1. The predominantly Protestant areas are county Antrim, with the exception of the remote northeast, and north county Down, with an extension along the Lagan and Bann valleys into north county Armagh. This accords with the historic settlement of these two counties by English and Scots prior to the plantation of the other counties in the mid-seventeenth century.

2. The regions of greater Catholic majority (60–75 per cent) are in the heart of county Tyrone, the border of county Fermanagh, south county Armagh, and south county Down. There is no significant increase in Catholics around the entire boundary; indeed, one of the worries of Northern Ireland at the time of the agreement was the considerable Protestant minority in county Cavan.

3. Based as it is on rural districts, the grain of the map is coarse and gives the somewhat false impression that the west has an over-all mixed population, with only a slight predominance of Catholics. It is, in fact, much more uneven and more like a jigsaw in detail, for there are many small intermixed areas where one or another of the sects is in a very marked majority. There are pockets of each, a fact which tends to give both the claim that they are in fact the majority. In the west the Protestants are more likely to voice this claim in defiance of the over-all Catholic majority,

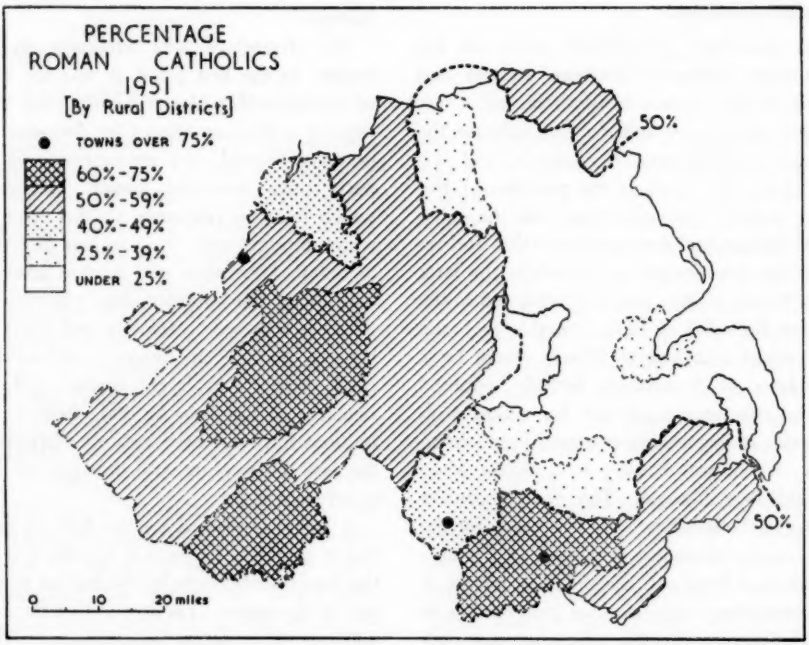

FIG. 1.—Northern Ireland: percentage of Roman Catholics

though their claim is illogical in view of the total situation. One can see why the Free State negotiators were concerned for county Fermanagh, county Tyrone, south county Armagh, and county Down.

The claims of the north were justified only in terms of the total population of the six counties, in which the Protestants were in a majority. Mapping religious differences, even on the broad rural district basis, gives a very different picture and, county by county, justifiable cause for dissatisfaction and, consequently, for friction.

Tension exists, therefore, inside the boundary. The Protestant minority in the western and southern areas has wealth and power beyond its numbers and considers partition justified along present lines. But, being numerically weaker, it fears a reversion to the Free State or dispossession by uprising. The Protestants are reminded that this was "planted" land, that initially it had been wrested from the Irish. Conversely, the republicans think of themselves as the dispossessed descendants of those Irish who are still suffering from intolerance and lack of opportunity; they are on the defensive. This kind of situation exists where there is a fairly even balance, and there are constant underlying tensions. Conditions are similar on the other side of the boundary.

As a result, certain adjustments are made; sometimes by a degree of segregation (e.g., shops in a village tend to be exclusively Roman Catholic or Protestant); sometimes by conforming to behavior patterns which are easily identifiable on both sides. In this respect it has been noted that orthodox belief and behavior on either side is tolerated, however disliked in principle. "However much they dislike [the] orthodoxy, behavior patterns have been evolved to deal with it." Consequently, badges and tokens are displayed, not only to show group solidarity, but, rather paradoxically, "to promote peaceful relations between groups. They make loyalties clear, and therefore make it possible to use the appropriate behavior pattern that will keep latent hostilities latent" (2).

Once such adjustments are made, disruption of life is at a minimum. These accommodations were in existence before the boundary, for they typify the mixed areas of the heart of Northern Ireland. But, for further disruptions which have arisen more specifically from the boundary, we must turn to changes rather different in character. They are primarily economic, though social intercourse is by now considerably modified, and tensions are eased by new adjustments. The major modifications in the former way of life arise from a serious dislocation of communications.

Figure 2 shows that, of the many roads which cross the boundary, comparatively few are "approved roads," that is, roads which have a customs check and which are the only ones which vehicles are permitted to use. The range of communications by unapproved roads is obviously going to be small and very local. Wider communications are extremely restricted. During the 1939–45 war all roads were sealed, a fact which had far-reaching effects on the social and economic life of those who lived near the boundary.

The extent of social adjustments made in areas surrounding the boundary which are connected by an unapproved road only has been shown in a recent study concerning part of the boundary of south Fermanagh (4). In 1921 Ballyconnell (county Cavan) was a service center, lying a mile to the south of what was then a county boundary. Its population was only 314, but it served a considerable area to the north. Its fairs attracted farmers from both county Cavan and county Fermanagh, and Derrylin, a tiny service center five miles to the north, in

county Fermanagh, came well within its orbit. Belturbet, another market town in county Cavan, also served that part of Fermanagh between Lough Erne and Derrylin (e.g., a bank office in Derrylin was a branch of the bank in Belturbet). Other services, and Ballyconnell, all sharply cut at the boundary. In response to the change, Derrylin's two shops became six. Retail trade suffered in Ballyconnell, but its wholesale trade improved, for, whereas it previously depended on Enniskillen for its wholesale

FIG. 2.—The nine counties of historic Ulster and the international boundary

particularly medical services, and the catchment areas of schools, churches, and social organizations also ignored the existence of the boundary between counties Fermanagh and Cavan.

Retail services were the first to change in response to the establishment of the international boundary. Today there are three retail areas, centered in Derrylin, Belturbet, goods, it now serves as a minor wholesale center, to Enniskillen's loss. Banking business no longer crosses the boundary, for Derrylin is now a branch of Lisnaskea. In administration there were of necessity adjustments which were based directly on the boundary. Some are recent. For example, the National Health Act of 1948 has meant a sharp differentiation in the areas served

by doctors. There is no legal reason why doctors should not cross the boundary for private patients, but those in Northern Ireland seem to have enough work on their panel without recruiting private patients from the south. School areas have changed little, and church areas and parishes have remained unchanged; and for these services there is much coming and going across the boundary. It would seem that economic changes came first, followed more slowly by social changes, though the latter become more sharply differentiated when the social service is tied to the state, as in the Health Act, and as will probably happen with the application of the Education Act of 1947. In addition, as social intercourse becomes more tied to transport, so the prohibition on travel on the unapproved roads will gradually give rise to segregation and the self-containment of units on either side. These adjustments are being made gradually, and, although they affect the whole of people's lives, the fact that social intercourse is not entirely prohibited means that tension is kept to the minimum and is probably no greater than in other parts of Northern Ireland where there are large minorities.

Although the above example is a small one, it serves to illustrate how economic spheres were cut by the 1921 boundary. It need hardly be stated that the big towns near the boundary, such as Londonderry, Newry, and Dundalk, suffered very considerably from the readjustments. Again detailed studies are lacking, but a minor town which has been studied is Clones, in county Monaghan, a town only half a mile from the boundary but with an approved road link with Northern Ireland (8). There can be little doubt that there has been a steady decline in Clones's fairs and market since 1921 and a corresponding increase in trading activities in Lisnaskea and Rosslea, both in county Armagh. The sphere of economic activity of Clones was drastically reduced. The population declined from 2,374 in 1911 to 2,083 in 1951, but the comparative numbers in the various religious denominations suggest that this decline of population is small compared with the movements of population in the last thirty years. The number of Catholics has increased from 1,517 to 1,814; Church of Ireland members have decreased from 589 to 186; and Presbyterians and Methodists, from 286 to 83. In spite of this, it should be stressed that there is still great freedom of movement and social intercourse. School catchment areas and church areas still generally ignore the boundary, and people cross it to visit the cinema and for other entertainment, such as dancing. But the sealing of the boundary during the war further curtailed the economic functions of Clones. The situation was made more difficult by the tortuous deviations of the old county boundary which here created an enclave in both county Monaghan and county Fermanagh. An unapproved road from the southwest goes from county Fermanagh to county Monaghan, crosses again to county Fermanagh and crosses the boundary yet again to reach Clones. During the war the Fermanagh enclave was served by vans from Lisnaskea, and this practice has persisted, while the Monaghan enclave developed its own center at Clonoony and found an outlet to markets and fairs at Scothouse, just south of Clones.

Neither of the studies cited above is detailed enough to analyze the social readjustments arising from the establishment of the boundary, the conflicts, or the mechanisms of overcoming them. Superficially, the changes have been gradual and have involved comparatively little tension. There is no doubt that tensions exist much as they would in other mixed areas of Northern Ireland and that the recognition of certain pat-

terns of behavior is in itself a safeguard against disruption.

Urban Segregation

In the last resort, rural communities have a kind of interdependence which makes a certain amount of co-operation essential, however dissimilar the component parts of the community are in theory. Conditions are different in a city. Segregation can be a dominant pattern in itself, for numbers may be great enough to allow communities to enjoy a certain degree of self-sufficiency. The situation in Belfast, for example, is quite unlike that of a mixed community in a rural area, and it would be worthwhile examining the problems of social adjustment in a city context.

The information about segregation in Belfast shown in Figure 3 is simplified from one previously published (3). The index of segregation was calculated in the following way: if the distribution of Protestants and Roman Catholics in Belfast were random, then we would expect the proportion of Catholics in any one section of the city—such as an enumeration district—to be the same as that for the city as a whole, in this case 25.9 per cent. If, owing to tension of any kind, there had been a sorting-out of the population, then the proportion would differ in various districts. The degree to which the proportion departs from the expected norm is the degree of segregation. If we find a census enumeration district which is exclusively Protestant or Catholic, then the segregation there is complete; if a district has 25.9 per cent Catholics, the expected random proportion, then it exhibits no segregation. In preparing an index for each district, segregation at 0 and 100 per cent was given the index 1; at 25.9 per cent, where there is no segregation, the index is 0. The index for all other districts was calculated as a ratio between 25.9 per cent and 0 per cent or between 25.9 per cent and 100 per cent—for example, districts halfway between 0 per cent and 25.9 per cent (12.95 per cent) and halfway between 25.9 per cent and 100 per cent (62.9 per cent) both have an index of 0.5. Each of the 231 census enumeration districts in Belfast was given an index on this basis and then arrayed. Figure 3 shows those districts which fell into the upper quartile of the array, that is, where segregation was very high, above 0.935. (Although this picture of segregation is the most accurate one available, it should be noted that the enumeration districts, which are merely convenient units for the collection of census data, sometimes overlap distinct social areas, so that a few districts with a low segregation index might in fact overlap two reigons of different denomination in which segregation is acutally very high.)

The distribution of the areas of very high segregation is a peculiar one. In West Belfast they are contained within a rough triangle, the apex of which lies near the center of the city. The center itself has very few permanent inhabitants, and so the segregated districts do not in fact reach the center. Much of the areas between the three western radiating sectors is occupied by factories and mills. The eastern area of high segregation lies a little beyond the manufacturing hub, east of the river. The map shows that all these areas fall within the industrial sectors of the city and that the residential North, South, and East have no districts with high segregation indexes. One could equate these different sectors of the city with socioeconomic class, and it is evident that, whereas segregation is very high in the manual workers' class, it is lower in the professional class. In another context the hypothesis that the degree of segregation varies in relation to socioeconomic ranking has been tested by giving each enu-

meration district a socioeconomic index and by relating the two indexes in a scatter diagram (3). The trend is apparent that segregation decreases as socioeconomic rank increases.

We are concerned, however, with the mechanism of segregation and its relation to social tension, and a very brief glance at the history of the Catholic minority in Belfast will help in understanding this.

It could be argued that, when Belfast was a walled town in the early seventeenth century, the Catholics were segregated by being kept outside, for an extramural suburb shown in a map of 1685, at a point at which the first chapel was built in 1783, is to this day the apex of the main Catholic axis. During the seventeenth and eighteenth centuries, however, the number of Catholics was so small (6.5 per cent in 1757) that no problem arose. There is no evidence that there was any conscious segregation at that time. Indeed, in the latter part of the eighteenth century Presbyterians were the main subscribers in the building of the first Catholic chapel, and the same period saw the

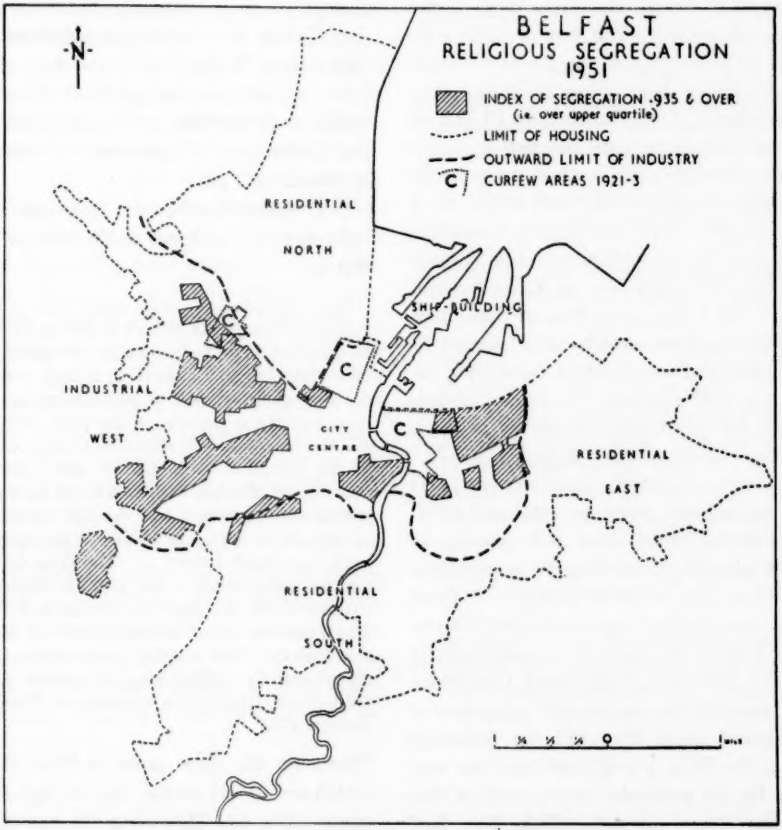

FIG. 3.—Belfast: high segregation in industrial sectors

rise of the volunteer movement, which was the champion of emancipation and the repeal of the Penal Codes. The civic condition of the Catholic minority was deplorable, and it was common sense as much as a new spirit of liberalism which convinced Protestants that, if Catholics were to play their part, it could only be as full citizens. Even those who could not subscribe to full emancipation realized that it was too much to expect loyalty from a disaffected minority.

However, a marked change in outlook corresponded to the rapid rise in the number of Catholics in the early part of the nineteenth century. The first accurate census of religions, that of the Royal Commission on Public Institutions in 1834, gives the number of Catholics then as 19,712, or 32.4 per cent of the total population. Labor was pouring into a town which was rapidly becoming industrialized, and much of it came from the West and other provinces of Ireland. In the next religious count (census of 1861) the proportion of Catholics had risen to 34.1 per cent. Tension had risen with the numbers, and by 1850 an act of parliament had been passed forbidding assembling and marching "in a manner calculated to perpetuate animosity between different classes of Her Majesty's people." There were repeated demonstrations and riots, particularly severe in 1857 and 1864. The commissions on these riots give us an insight into the mechanism of segregation. It is clear that even by midcentury there was a considerable degree of segregation in West Belfast, a result of tensions arising with the influx of Catholic labor. Conditions were considerably aggravated whenever a disturbance arose. By 1857 the industrial core of the West was divided into two segments by one particular street; north of this was the Pound district, which then had been "predominantly Catholic for years," and south of it there was the mainly Protestant Sandy Row, though "there was some intermixture, and a few Roman Catholics resided in the Sandy Row area, and a few Protestants in the Pound district. Since the commencement of the late riots [1857], however, the districts have become exclusive, and by regular systematized movements on both sides, the few Catholic inhabitants of Sandy Row have been obliged to leave it, and the few Protestant inhabitants of the Pound district have also been obliged to leave that district" (6).

That was the mechanism of segregation, though the report stresses that, except in July (when the Protestants celebrated the victories of William III), the two groups "met in peace; in business there were ordinarily no distinctions made, and Protestant and Catholic and Orangeman lived together in friendship" (6).

Segregation had become more rigid thirty years later, for a report on the riots of 1886 states:

> The extremity to which party and religious feeling has grown in Belfast is shown strikingly by the fact that the people of the artisan and labouring classes . . . dwell to a large extent in separate quarters, each of which is given up almost entirely to persons of one particular faith, and the boundaries of which are sharply defined. In the district of West Belfast, the great thoroughfare of Shankill Road, with the network of streets running into it, and the side streets connecting those lateral branches, is an almost entirely Protestant district. . . . The great Catholic quarter is due south of the Shankill district and consists of the thoroughfare known as the Falls Road, and the streets running south of it. Due south of the Falls district is Grosvenor Street, almost entirely inhabited by Protestants, so that the Catholic quarter lies between two Protestant districts [7].

These are the three areas in West Belfast which are shown on the map of high segregation (Fig. 3). They were the outcome of periodic rioting in the nineteenth century.

The tension which gave rise to the sharp segregation in the industrial districts of Belfast varied considerably from time to time, and doubtless the degree of segregation lessened in intervening periods. But a climax was reached after the partition of Ireland, and for a period of three years serious rioting, with grievous loss of life, punctuated the life of the city. Nearly all the incidents which took place during that period occurred in the areas of high segregation (as suggested by the curfew areas shown on Fig. 3). Incendiarism and terrorism led to scores of families moving from localities in which they had been a minority and resettling among neighbors of their own religious beliefs. This made absolute the segregation of very large areas of the city. Some districts remain so to this day. If comparable data for previous censuses were available, it would be interesting to measure the easing of segregation since the early 1920's. It was suggested above that it has eased to a considerable degree in middle-class suburbs, but more data would enable a far-reaching analysis to be made of segregation as a response to social conflict and of its varying degree in different social classes.

The situation is one which also bears a relation to the ratio of Protestants to Catholics in the city as a whole. A marked increase in the Catholic ratio might well lead to greater segregation among even the professional classes; tension would certainly increase. Fertility ratios and projected populations suggest that, other things being equal, the ratio of Catholics may well increase very considerably in the next two decades. This would dismay a great many Catholics, who see in the present equilibrium the possibility of lessening tensions and increasing co-operation.

It will have been evident from what has been said that the geographer's contribution, much as it might aid the student of politics, is itself limited because it stops short of analyzing the social and personal tensions which arise in the geopolitical situations outlined above. It is possible that his methods can lay bare problems and suggest, by correlations and mapping techniques, whole fields of inquiry for the student of society, whose task is to further understand the conflicts so revealed and attempt their solution.

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American dependence on materials imports the world-wide resource base[1]

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I. *Materials Wealth versus Foreign Dependence*

The United States built its prosperity on a lavish use of the wealth of raw materials to be found within its own borders. Technological change and an unprecedented rate of production have combined to render this once vast materials wealth insufficient. The nation's industries increasingly draw their raw materials from a world-wide resource base. As requirements continue to rise and depletion of domestic sources is accelerated, the trend toward dependence on foreign sources is marked.

When Brooks Emeny wrote *The Strategy of Raw Materials* in 1934, he used as a reference and guide the list of strategic commodities prepared by the War Department which represents all the important raw materials of war for which the United States was partially or wholly dependent upon foreign sources. There were twenty-six commodities which the War Department considered sufficiently important to warrant their being classed as "strategic." Of this group, after a thorough and scholarly analysis, Dr. Emeny considered that no more than five or six were of really vital concern. He concluded:

> Insofar as resources in raw materials and foodstuffs may be taken as a factor of national power, the situation of the United States is without parallel. . . . The formidable character of our inherent national strength, derived from our raw material position, must give pause for thought on the part of any nation contemplating the risk of hostilities with us [5, p. 174].

Even as recently as twenty-five years ago the materials resources of the United States seemed superabundant, almost limitless. But the appetite of the nation's industries has proved to be insatiable, and the United States today is a major importer of two (iron ore and petroleum) of the three great necessities of an industrialized society, retaining self-sufficiency only in coal. The nation is indeed a net importer of all metals except two (vanadium and molybdenum) and is the world's largest importer of copper, lead, and zinc, although once an exporter of all three in huge quantities (9).

Further, of the materials it possesses, the United States is consuming more than it can continue to produce without considerable increase in costs; this condition is aggravated by both continually rising requirements and decreasing reserves. For all practical purposes the United States today is absolutely lacking in several important minerals and can provide only a fraction of its needs for many others.

The list of strategically critical materials has grown steadily in numbers. As of June

[1] The views expressed in this paper are those of the author and do not necessarily represent official views or policy.

30, 1958, seventy-five items were listed in Group I as eligible for stockpile acquisition through purchase. The list not only has lengthened but also has exhibited marked shifts in internal composition in twenty-five years. Changes have been dictated by a combination of technological advance and alterations in domestic production and consumption. Sugar, coffee, arsenic, balsa, camphor, and cork are among the items listed as critical in 1934 which do not appear currently. Only ten of the twenty-six items considered by Emeny have retained their "essential" character, but those remaining are chiefly minerals for which the requirement has been multiplied many times (18). The raw-materials position is clearly a lesser component of the national strength in 1959 than it was in 1934.

Actually, considerable American dependence on foreign materials is not new. The importance of materials imports in the past has been obscured by the relatively small importance of foreign trade to the domestic economy. In fact, during the period between World War I and World War II, the United States share of total world imports was exceeded only by the United Kingdom. With respect to raw materials only, the United States was easily the most important importer (3, p. 512). As early as 1929, American imports of non-fuel minerals were greater than the rest of the world combined. During World War II the United States received raw-materials imports from fifty-three countries and obtained no less than twenty-seven minerals exclusively from foreign sources (2, p. 26).

The long-term shift in the raw-materials position of the United States has been placed in sharp relief by several post–World War II developments which aggravate the problems of materials supply. First, other high-consuming nations, primarily in western Europe and militarily allied with the United States, face increasing difficulties in raw-materials procurement. Serious depletion of their own resources coupled with the weakening or severing of ties with their colonies and dependencies has important implications for their economic strength.

Second, the resource-rich but underdeveloped nations now tend to aspire to industrialization rather than materials export. This is particularly true of former colonies, now independent states, that often view raw-materials development programs as harbingers of a return to imperialism. A corollary of this new nationalism is the tendency of private capital to avoid such countries, fearing expropriation.

Third, the cold war has not only made necessary vast programs of armament, costly in raw materials, but has also disrupted the normal patterns of international trade. The loss of Chinese tungsten is but one example of the dislocations inherent in artificial trade barriers.

The basic objective of materials policy in the field of foreign resources must be to assure an adequate flow of essential raw materials to the industries of the United States. At the same time it is important to remember that raw-materials policy is but one component of over-all foreign trade policy which, in turn, should be an integral and important part of American foreign policy as a whole.

II. *Raw Materials and National Security*

War as the major activity of mankind has dominated the world economic scene for more than half the lifetime of half the people now living and all the lifetime of the remaining half. Clearly, wars and the preparation for wars inevitably and deservedly will receive much emphasis when raw-materials policy is discussed.

Traditionally, the United States (and

most other nations) has sought to meet its wartime military requirements from domestic sources exclusively. In the past there were compelling advantages in concentrating the sources of military supply within the strategically secure borders of the United States. No major power could afford to rely to any considerable extent on external sources of supply for its military requirements in the age of wars of attrition. The disruption, risks, and costs of wartime trade were large enough to justify the conclusion that self-sufficiency, or a reasonable approximation, was best for a nation at war (7, p. 209).

Many proponents of wartime self-sufficiency have carried the argument to its logical conclusion and contended that prudence dictated peacetime self-sufficiency as a preparation for war. The classic case for the protection of domestic mines, mills, and smelters rests very largely on the assumption that, with the advent of war, military production would place heavy demand on domestic sources and that therefore these facilities must be safeguarded from external competition in peacetime lest they atrophy. Even such free-traders as Adam Smith and J. S. Mill conceded that considerations of defense were often overriding in the field of international trade.

The theory of autarchy is no longer respectable in economics, but the traditional concept of war potential is still reflected in the existence of the Office of Civil and Defense Mobilization and the use of tax concessions to stimulate the expansion of domestic defense industries and perhaps finds its greatest expression in the large-scale stockpiling of raw materials.

The first official step toward stockpiling was taken by the Navy Department in 1938, on the eve of World War II, with a token appropriation of $3,500,000 for the accumulation of reserves of strategic raw materials. The Procurement Division of the Treasury Department was authorized to begin the accumulation of stockpiles in 1939 and was granted $70,000,000 to be spent over a four-year period. In 1940 the Reconstruction Finance Corporation was given broad authority to produce, acquire, and transport materials for defense (1).

Under the Strategic and Critical Materials Stockpiling Act of 1946, the postwar scope of stockpiling was greatly broadened. This act was designed to cover the risk of all the more serious and more extreme wartime deficiencies in supplies of raw materials. The national security nature of the measure is clear:

> The stockpile is not designed or expected to break all materials bottlenecks, to solve all production problems, to stabilize minerals and agricultural commodity markets, or to maintain marginal and submarginal mines in production in periods of falling demand. It is strictly a limited national security measure [19].

Secondary objectives of the Strategic and Critical Materials Act were the development of new domestic sources of strategic materials and the encouragement of the use of substitutes and alternates for strategic materials where possible. While some success was obtained in increasing domestic production and in substitution, stockpiling activities fell far short of objectives prior to the Korean crisis. On December 31, 1949, stockpiles physically on hand were equal to about 30 per cent of the objective, and the nation entered the Korean conflict with unfulfilled stockpile schedules for rubber, copper, zinc, and chromium, among other commodities (1).

The aggressive stockpiling activities which commenced in 1950 after the outbreak of hostilities affected the current production of both military and civilian goods. Stockpile purchases were at least partially responsible for driving up to record peaks the prices of

such items as rubber and tin, with important international repercussions. It seems reasonable to state that stockpiles of materials, whatever their intrinsic worth, cannot be built properly in a time of crisis.

Largely through coincidence, the United States once experienced the benefits of a major stockpile whose original purpose, ironically, was to deal with surpluses rather than to reserve supplies for war. When the nation entered World War II, large stocks of wheat, corn, and cotton, among other commodities, had been accumulated by the federal government as collateral for price-supporting crop loans. The "Ever-Normal Granary" was not designed with a war emergency in mind, but, when the war came, the reserves were a welcome source of strength (12, p. 162).

The pleasant memory of the granaries, the haunting sense of failure to prepare for two world wars and the Korean intervention, and the prodding of numerous commissions, committees, and agencies have combined to bring the stockpiling program to a very considerable level of achievement. On the basis of June 30, 1958, market prices, the stockpile inventory of Group I materials was valued at that time at $5.4 billion. Strategic stockpile inventories equaled or exceeded basic objectives for 63 of 75 materials, and for 50 of the 63 materials maximum objectives had also been achieved. The stockpile was more than 80 per cent complete as measured against objectives in effect (19).

The ability to fix "basic" and "maximum" objectives would seem to indicate a pretty definite opinion concerning the likelihood of war, its nature, and duration. The differentiation between basic and maximum objectives is rather subtle. The basic objective assumes reliance "on sources of supply factored to reflect estimated supply risks," while the maximum objective "includes an additional allowance to take into account the complete discounting of sources of supply beyond North America and comparably accessible areas." It is interesting to note that the requirements "shall be discounted for wartime losses of consuming capacity to the extent that such losses can be reliably estimated," while "domestic supplies are discounted in cases of excessive concentration to the extent of the estimated time required to restore capacity that may be damaged." All these demanding and complex estimates are based on the following proposition: "The strategic stockpile objectives shall be adequate for limited or general war whichever shows the larger supply requirement, and shall be limited to meeting estimated shortages of materials for a three year emergency period" (20, p. 1).

Writers in the field of military affairs when discussing war usually admit of several possibilities, although differing widely concerning the probability of each. The most often discussed is the total war, the "thermonuclear holocaust," characterized by a massive exchange of mass destruction weapons. The other possibilities are all, in the last analysis, one type or another of what has come to be known as limited war, which might be defined simply as anything less than total war. While skirting the great debate concerning the relative likelihood of occurrence and the merits of preparing for the various categories of conflict, it is possible to consider the implications of total and limited war for raw-materials policy.

It is widely held that unmobilized war potential of any sort is totally irrelevant once unlimited nuclear war begins. Thomas Finletter, one of the most articulate proponents of this thesis, suggests that undue emphasis on industrial capacity may be actually deleterious to the preparation for such a conflict:

> The nostalgic idea that our industrial potential is our greatest military asset could ruin our military planning. There may not be any long war to give our industrial potential the time to bring its weight to bear. We must build our military force on the exact opposite of the industrial potential notion [6, p. 256].

Others have argued that hostilities will continue after the initial exchange is concluded, industrial capacity remains important, and ready stockpiles of strategic materials are vital to this capacity. This contention deserves close examination. In their testimony at the United States congressional hearings on fall-out, W. W. Kellogg and C. K. Shafer discussed the radiological effects of a hypothetical war situation in which what was assumed to be a representative number of fission weapons was exploded over the continental United States. They estimated, using currently approved methods, that about 100,000,000 deaths in the United States could be expected to result from such an attack (13). The actual total megatonnage used in such a war could, and perhaps would, be many times larger than that posited in the staff exercise. If there is a place for stockpiles in the preparation for such a war, the materials selected should be largely fabricated, preferably ready-to-go. Quite aside from the demoralization and dislocation of the population, the expected damage to industrial capacity and transportation facilities makes raw-materials stockpiling almost meaningless.

The limited wars may range from various selections of limited-nuclear conflicts through conventional (old-style preatomic) military operations on several scales, to the suppression of guerrila activities or little more than a show of force. Wars may be limited in the weapons employed, in the geographical area involved, in the participants, and in aims or objectives. The range is so great that few generalities are appropriate.

Obviously in the large-scale near-conventional war described by Klaus Knorr (7) and others, economic capacity will have considerable impact. But, if current expectations are reflected at all accurately in current appropriations and force levels, the alternative to total thermonuclear war is much more likely to be very limited military operations on the far-distant periphery. Such peripheral wars place a great premium on speed of reaction and military proficiency. Trained, disciplined, well-equipped troops in sufficient numbers, and possessing both strategic and tactical mobility, are decisive in such conflicts. Small wars generally must be fought as the big war is deterred, by forces in being.

Even if industrial potential is conceded importance in some instances, the validity of a raw-materials security concept which reflects experience in the world wars is questionable. Stockpiling and reliance upon domestic producers was based on the vulnerability of distant suppliers and of goods in transit, particularly to interception at sea. With the development of intercontinental attack techniques and the fission and fusion weapons, the domestic sources of supply are perhaps as vulnerable to attack as the foreign sources are vulnerable to interception. The domestic production facilities, that in theory will require an uninterrupted flow of raw materials, are infinitely more vulnerable in wartime than ever before.

This is not intended to deny the importance of raw-materials policy to national security. Certainly, the need exists to maintain the capacity to produce in peacetime the military material for the deterrent force and for the forces in being that must wage the limited wars.

Much more important is the need to recognize the larger aspects of national security. The United States is threatened not only by war but also by aggressive action which

falls short of war. The Sino-Soviet bloc continually exerts political and economic pressure which can only be countered successfully in kind.

It is American policy to work for economic stability and strength not only in the United States but in the entire non-Communist world (18). To an important extent this spread of economic prosperity is dependent upon the health and growth of industrial development throughout the world, and this in turn is based on, among other things, an adequate supply of raw materials. The political dynamics of the world-wide alliance system of the United States lead increasingly toward co-operation and mutual support in the raw-materials field as in more purely military fields.

The assurance of a steady flow of raw materials to the American economy is a matter of interest not only to the United States but to the many other countries which depend upon American strength. On the other hand, other nations are, and will be increasingly, contributors to the strength of the West, and they, as well as the United States, require strong, complementary economies. Efforts to allocate equitably and to control constructively the distribution of scarce and much-wanted materials thus have a solid base of mutual self-interest.

III. *Improvement of the Materials Position Strengthening Domestic and Foreign Resources*

Action to improve the total materials position of the United States may be taken in three fields:

1. More materials may be obtained from domestic resources by attacking the technological, physical, and economic barriers that presently limit the domestic supply.

2. More materials may be obtained from abroad.

3. Materials consumption may be reduced or the patterns of use may be altered by redesign to eliminate waste and overuse or by shifting the burden from less abundant to more abundant materials (12).

Domestic supply may be increased by exploration which leads to discovery of new sources; by using known resources, including those of lower quality, more fully; and by finding uses for unemployed materials and new uses for those in abundant supply. None of these efforts excludes any other; combinations of all methods are necessary if the domestic supply is to be significantly increased.

Geologists predict that the United States still possesses vast hidden mineral resources but generally agree that discovery requires new methods. Almost all of the ore deposits that have been found to date have outcropped, traced from surface indications. It seems reasonable that additional ore deposits exist and that methods may be developed to locate them. Since 1939 the Bureau of Mines and the Geological Survey have been authorized to explore for minerals of significance to national security, but since the war direct government exploration has been aimed principally toward expanding general geologic knowledge. Because of the great expense involved in subsurface prospecting, the expansion of the government's role in this field seems desirable. As a minimum government contribution, the topographic and geologic mapping of the United States could be accelerated.

The fuller use of known resources offers a promising approach to the increase of domestic supply. Mining techniques are often wasteful from a materials point of view. It is said that about 50 per cent of the commercial grades of coal and more than 50 per cent of the petroleum in an average pool are left behind in the process of production. Roughly one out of every

ten pounds of copper in ores is thrown on the talings heap; more sulfur is blown from the smokestacks of industry than is consumed in industry; enough natural gas was lost in production in 1950 to supply the total gas needs of eleven million homes (12, p. 8).

These physical wastes do not always, or even usually, represent economic wastes, in the sense of less profit per unit of investment. It frequently costs more (in dollars) to eliminate the very real materials wastage than the savings would represent. Conservation of resources has long been accepted as a highly desirable social objective, but progress to date has been restricted by an economy which is governed by the profit motive.

Technical advances which would make it profitable to reduce physical wastes and thus eliminate the need for government regulation would seem to be the ideal solution. In fact, many such profitable opportunities exist today yet are neglected by industrial companies with outmoded equipment and production methods or insufficient motivation to seek the potential profit in waste reduction (21, p. 2). Municipal ordinances which required the purification of smelter gases formerly expelled as waste provide an example of forced conservation which was incident to another purpose. The greater part of the present supply of cadmium is obtained in this manner as well as a large proportion of the domestic requirements for sulfur and nitrate (8, p. 91).

Second-grade resources, when forced into use by depletion of primary sources, are often found to have distinct advantages in certain applications. The experience of the newsprint industry, once demanding northern spruce but now content with the more plentiful, faster-growing southern pine, and the plywood industry, now using a grade of lumber formerly rejected as culls, may be cited as examples of technological progress under the impetus of necessity.

Perhaps the greatest increase in domestic resources could be achieved if new uses could be devised for resources presently lightly employed or unused. In this respect major materials research has only begun. The successes in extracting nitrogen from the air and magnesium from the sea give an indication of what can be accomplished. The array of new synthetics—various highly versatile plastics, artificial fibers, synthetic rubber, and the like—in many cases are both cheaper than and superior to the commodity replaced.

Serious conservation problems result from the lack of care given articles produced from scarce materials, the failure to reclaim scrap metals, and the like. Losses in the United States through corrosion alone are said to run as high as $5.5 billion a year. Facilities for the collection, recovery, and reclamation of once-used materials are haphazardly organized and permit recovery of but a small fraction of potential scrap. Frequently, the man-hour cost of reclaiming such material is so great that recovery does not pay, but better techniques and organization for collecting, sorting, identifying, and reclaiming scrap would add large tonnages to the total supply of metals and other materials and reduce the drain on primary resources.

The production of substitutes is an integral part of a nation's raw-materials supply (15, p. 151). German wartime experience in this regard is particularly instructive. German supplies of iron and steel, coal, aluminum, magnesium, lead, and zinc, although not large by American standards, were made to last through six years of war. With the most minimal supplies of copper, tin, and the ferro-alloys, Germany managed to meet not only her war requirements but

also the most essential civilian needs in almost all of Europe until the final year of the war. While German consumption of the essential materials of war remained almost constant in the years 1938–44, production of finished military items increased fourfold (11).

The United States can encourage increased materials receipts from abroad both directly and indirectly. Materials export still offers opportunities to the less developed countries and can yield them much-needed foreign exchange. Development of materials production can be made attractive by grants and loans for the expansion of auxiliary facilities—railroads, roads, port development—which may be expected to increase the general productivity of the country. Such programs, if financed from abroad and properly managed, should divert little local capital and manpower from other domestic activities and, by introducing the availability of new skills, facilities, and materials, should aid rather than hinder the development of other industrial activities.

Tariffs and other barriers to international trade not only increase the cost of obtaining needed materials from abroad but also act to discourage investment in countries with a potential export surplus. As the world's largest single importer of materials, the United States is in an effective position to assume leadership in the removal of trade barriers (12).

The fundamental and extreme instability of the world materials market cuts across many of the problems of expanding foreign materials production. Raw-materials prices are substantially more volatile than most other prices and tend to react sharply to small shifts in supply and demand. This marked instability strongly affects both the volume of private investment and the attitudes of foreign governments toward expansion of materials production. While long-term changes in prices perform an essential role in the allocation of resources in a market economy, the exaggerated swings in raw-materials price are economically indefensible. Among the stabilizing devices which might be considered are international commodity agreements, stabilized pricing policies, and the use of buffer stocks. As a beginning, purchases for the authorized defense stockpiles could certainly be accomplished with less market dislocation than has characterized such purchases since the end of World War II (16, p. 302).

More accurate determination of the extent and location of the world's mineral resources would be a significant aid in developing additional sources of supply. The underdeveloped countries are generally unable to undertake extensive surveys of their minerals potential on their own, and the difficulties, costs, and risks often deter private capital. A need exists for more extensive government participation in this field, perhaps through the expansion of the scope of such agencies as the Geological Survey and the Bureau of Mines.

American science and technology can be important in many other fields as well. The contributions of medical research to the supply of industrial diamonds is but one example. Malaria and dysentery were brought under control in the African diamond fields, and "it may be stated safely that if it were not for this tropical medical research, the diamond production of the world would be at least one-third less than it is" (8, p. 92).

Reductions and shifts in demand provide important opportunities for strengthening the resources position. The United States has always been lavish in its use of materials. More often than not, two pounds of material are used where one would do.

Great quantities of material are wasted by overdesign and overspecification, and products are manufactured with little regard for durability or maximum utility.

These are valid choices, of course, in a society which places a high premium on freedom of choice. But such production and consumption habits are expensive in terms of increasingly scarce materials. The market pressures, reflected in rising prices, that will necessarily force reduction of such materials use may come too late to prevent irreparable damage to the domestic resources position. As Zimmermann put it:

> We cannot escape the fact that we are living under a price economy and that therefore the rate of exploitation of natural resources is generally determined by the price which can be obtained for the product in the market and the profit which can be made. This causal relationship between waste elimination and rate of exploitation is vital; a disregard of the pertinent facts of price dynamics precludes a sound understanding of natural resources [22, p. 805].

This is not to deny that economies of use and economies of production have occurred and will continue to occur in the future under the stimulus of highly competitive conditions. But, if technological improvements result in lower prices and if lower prices stimulate demand, the rate of depletion of resources may be accelerated rather than retarded. The elimination of needless waste is laudable in itself but, if it leads to a greater rate of consumption, is hardly equivalent to conservation.

IV. *The Additive Metals: An Illustrative Example*

The additive metals—chromium, cobalt, columbium, molybdenum, nickel, tungsten, and vanadium—form a reasonably homogeneous group and are more likely in their sum to illustrate the various problems inherent in resources policy than a like number of materials selected at random. Their importance to the economy is great and is growing as production of alloy steels is increasing at a faster rate than the carbon steels, and new uses are certain for some or all of these metals. The possibilities of substitution within the group are numerous, and the strategic criticality of the metals is attested by the fact that all seven are stockpiled. A world-wide scattering of deposits permits some choice among sources of supply, which presents a wide range of political, economic, and military problems.

For these reasons requirements for and sources of this group of seven minerals were selected for analysis to emphasize changes in the American materials position which have occurred in the two decades from the outbreak of World War II to the present. The base year of 1938 was selected as the last non-war year; the year 1956 is the most recent one for which reasonably complete statistics are available.

Chromium.—Chromite moves in international trade in bulk, and American supplies are obtained chiefly from far-distant sources. In 1938 the United States was the chief consumer of the world output, and chromite was listed by the War Department as one of the four mineral commodities constituting the first-priority class for stockpile reserves. Domestic production was insignificant, and the steel industry accounted for more than three-fourths of domestic consumption.

In 1956 domestic production reached nearly 200,000 tons but was non-competitive on the world market; virtually the entire output was purchased by the government at incentive prices. Metallurgical uses continued to dominate consumption, but refractory and chemical uses had increased greatly. The most important foreign suppliers were the Philippine Islands, Turkey, the Union of South Africa, and Southern Rhodesia. Transportation problems involving long and tenuous supply lines are partially

compensated by friendly attitudes and relatively stable political conditions in these nations. Cuban and New Caledonian supplies, while greater than in 1938, represented a diminishing proportion of total imports and probably cannot be expanded greatly (Table 1).

Cobalt.—There was no domestic production of cobalt in 1938, and total world production was estimated at less than 4,500 metric tons (17). Imports, because of a recession affecting the ceramic and chemical industries, had fallen sharply from the preceding year. Extensive experimentation on the recovery of cobalt from iron and copper ores had begun.

TABLE 1*

CHROMITE PRODUCED AND IMPORTED FOR CONSUMPTION IN THE UNITED STATES, 1938 AND 1956, BY COUNTRIES

(In Long Tons)

Country of Origin	1938	1956
United States	812	186,896
Cuba	39,529	46,636
New Caledonia	28,520	44,388
Philippine Islands	78,233	609,799
Southern Rhodesia	80,000†	322,927
Turkey	20,392	475,440
Union of South Africa	88,299†	403,857
All others	17,112	54,498
Total imports	352,085	1,957,345
Total available	352,897	2,145,241

* Source: United States Bureau of Mines, *Minerals Yearbook.*

† Total for Africa is correct. Exact breakdown not available as between Southern Rhodesia and the Union of South Africa.

Domestic production in 1956 was more than double domestic requirements of less than twenty years earlier, but a far greater volume of imports was required. Belgium and the Belgian Congo were by far the most important suppliers of cobalt ore, metal, and oxide imported for consumption. Future production in Canada as a by-product of nickel may be expected to increase, but the heavy dependence at present upon what amounts to a single source deserves emphasis (Table 2).

Columbium.—World production had risen from about 6 tons in 1930 to almost 750 tons in 1938, largely because columbium-bearing stainless steels had been discovered to be more weldable and more resistant to corrosion and high temperatures than ordinary stainless steel. The United States took more than half of the world output, all of it from one company in Nigeria (17). There was no domestic production.

In 1956 domestic production under price incentives exceeded 200,000 pounds but

TABLE 2*

COBALT ORE, METAL, AND OXIDE PRODUCED AND IMPORTED FOR CONSUMPTION IN THE UNITED STATES, 1938 AND 1956, BY COUNTRIES

(In Pounds)

Country of Origin	1938	1956
United States	.....	3,657,000
Belgian Congo	†	11,435,768
Belgium	639,138	2,108,800
Canada	512,980	1,282,422
Finland	329,825	.....
Germany	141,375	498,044‡
All others	138,357	274,966
Total imports	1,761,675	15,600,000
Total available	1,761,675	19,257,000

* Source: United States Bureau of Mines, *Minerals Yearbook.*

† Separate figures not available for Belgium and the Belgian Congo in 1938.

‡ West Germany only.

furnished a negligible portion of domestic requirements. Imports, while several times greater than in 1938, actually declined from the preceding year as a direct result of cessation of purchase under the United States Purchase Program in May, 1955. While average price per pound dropped from $2.07 in 1955 to $1.47 in 1956, Nigeria remained the major source of supply, with more than 60 per cent of the columbite received (Table 3). A technically feasible process for treating Canadian pyrochlore was announced which, if economically successful, would greatly lessen United States dependence on water-borne imports.

Molybdenum.—The United States produced more than 16,500 tons of molybdenum from ores and concentrates in 1938, about 90 per cent of the world output. Almost 50 per cent of domestic production was exported. New uses stimulated widespread exploration in other countries, but no significant foreign sources were discovered.

Domestic production had risen to 28,700 tons in 1956, still about 90 per cent of the world total. Recovery as a by-product of both copper and tungsten had become important. Export shipments, although higher than in any previous year, were insufficient to meet foreign needs, and molybdenum was in very short supply in the western European nations.

TABLE 3*

COLUMBITE OBTAINED FROM DOMESTIC AND FOREIGN SOURCES FOR CONSUMPTION IN THE UNITED STATES, 1938 AND 1956, BY COUNTRIES

(In Pounds)

Country or Area of Origin	1938	1956
United States	.....	216,606
Belgian Congo	.....	758,919
Nigeria	820,000	3,593,114
Other African countries	.....	96,949
Asia	.....	523,091
Europe	.....	563,227
South America	.....	164,253
Total imports	820,000	5,699,553
Total available	820,000	5,916,159

* Source: United States Bureau of Mines, *Minerals Yearbook.*

Nickel.—The demand for nickel in the United States in 1938 was adversely affected by the substantial recession of activity in the iron and steel industry, major user of nickel, and declined about 50 per cent from 1937. Domestic production was small, amounting to less than 10 per cent of domestic consumption. Canada, with 88 per cent of the world supply, furnished 98 per cent of American imports of nickel. The International Nickel Company of Canada, Ltd., alone supplied more than 80 per cent of total United States requirements.

In 1956 the supply of nickel from foreign and domestic sources was inadequate to meet demand. Intensive activity continued in the exploration for new sources, the development of new mines, and the search for substitute materials. Rapid tax amortization and government purchase contracts were offered to spur investment in both foreign and domestic productive facilities. Imports of nickel increased for the seventh consecutive year. Canada and Norway supplied 87 per cent of United States imports; the nickel from Norway being produced chiefly from Canadian ore (Table 4).

TABLE 4*

NICKEL FROM ORE AND MATTE PRODUCED AND IMPORTED FOR CONSUMPTION IN THE UNITED STATES, 1938 AND 1956, BY COUNTRIES

(In Short Tons)

Country of Origin	1938	1956
United States	2,716	22,800
Canada	25,000†	106,764
Cuba	.....	18,791
All other	500	17,087
Total imports	25,500	142,642
Total available	28,216	165,442

* Source: United States Bureau of Mines, *Minerals Yearbook.*
† Estimated; complete statistics unavailable.

Tungsten.—Tungsten was listed as a strategic commodity in 1938, but the Bureau of Mines reported in that year that "the position of the United States with regard to this essential metal was far less vulnerable than with respect to manganese, tin, or chromium" (17, p. 620)—this in spite of the fact that China was the principal, almost the only, foreign source of tungsten, and Japan had captured both Shanghai and the railroad through South China to Canton and Hong Kong! Imports from China in 1937 totaled 7,104,224 pounds, more than the total tungsten concentrate available in 1938. The United States was the world's

second largest producer, and expanded domestic production coupled with a recession-induced drop in demand eased the tungsten situation in 1938 (Table 5). A high tariff and high world prices had resulted in a measure of self-sufficiency. The same combination, however, plus the meager funds available, prevented any purchases for the strategic stockpile prior to the Japanese invasion of China.

In 1953 domestic production, imports, and consumption were all much greater than in 1938. Domestic production initially was stimulated by the Domestic Tungsten Purchase Program, which assured a market at $63 per short-ton unit, but declined sharply with suspension of government pur-

TABLE 5*

TUNGSTEN PRODUCED AND IMPORTED FOR CONSUMPTION IN THE UNITED STATES, 1938 AND 1956, BY COUNTRIES

(In Pounds)

Country of Origin	1938	1956
United States	6,088,000	14,761,000
Bolivia	2,286	9,748,925
Canada	.....	1,703,941
China	138,380	.....
Mexico	27,585	779,540
Portugal	.....	1,395,016
Republic of Korea	.....	2,632,180
All others	153,834	1,663,089
Total imports	322,085	18,922,691
Total available	6,410 085	33,683,691

* Source: United States Bureau of Mines, *Minerals Yearbook*.

chase. The domestic consumers, as in most recent years, purchased concentrate primarily from foreign sources because of price differentials. Suspension of United States stockpile purchases and uncertainty regarding the possible re-entry of tungsten concentrate from China to Western markets depressed open-market prices and consequently foreign as well as domestic production.

Vanadium.—In 1938 the United States, which had been a poor fourth, became the world's leading producer of vanadium ore and concentrate. Vanadium had been found to produce high-strength steel and iron with less exacting heat treatment than that necessary with other alloys, at a lower cost. Imports from Peru, the only foreign source, increased despite the very large increase in domestic production.

With the entry of the Atomic Energy Commission into the carnotite region of the Colorado Plateau for the purpose of obtaining uranium, the greater part of the domestic production became a by-product or co-product of the more critical material. In

TABLE 6*

VANADIUM IN ORES AND CONCENTRATES PRODUCED AND IMPORTED FOR CONSUMPTION IN THE UNITED STATES, 1938 AND 1956, BY COUNTRY

(In Pounds)

Country of Origin	1938	1956
United States	1,439,296	7,735,088
Peru	1,384,320	.....
All others	.....	.....
Total imports	1,384,320	.....
Total available	2,823,616	7,735,088

* Source: United States Bureau of Mines, *Minerals Yearbook*.

1956 the production of vanadium, as a result of this undertaking, reached a new record. Despite increased domestic consumption, the supply of vanadium exceeded requirements. No vanadium-bearing ore or concentrate was imported in 1956, and the United States was responsible for approximately 90 per cent of world production (Table 6).

Summary.—United States demand for the additive metals may be expected to continue to rise at rates comparable to, or greater than, the national output as a whole. Demand abroad will also increase, although the other free-world nations are rather less likely in the near future to require large amounts of the specialized steels in which the ferro-alloys are important. Analysis of

the consumption and import patterns of this group of minerals highlights many of the factors which must influence resource policy. Most striking is the very large rise over two decades in the consumption of all these materials, usually paralleled by an increased dependence on foreign sources.

The United States produces a relatively small portion of current requirements of chromium, cobalt, columbium, and nickel. Although a large producer of tungsten, the nation depends upon imports for more than 50 per cent of domestic requirements. The sharp rise in consumption is emphasized by the fact that domestic production of all these metals in 1956 would furnish a very substantial percentage of—and in the case of cobalt and tungsten exceed demand at—1938 levels. Of the seven, only molybdenum and vanadium currently are available in the United States in abundant quantities, but in these two minerals the position is superlatively strong, accounting in both instances for more than 90 per cent of world production. Even the present high level of molybdenum production is insufficient to meet both domestic needs and the requirements of our allies, which introduces the allocation problem from a different viewpoint. The present excess of vanadium, a direct result of the great government investment in uranium production, is probably a transitory phenomenon and may be expected to be dissipated by rapidly rising consumption.

Foreign sources vary widely in the transportation problems they present and in their political and economic stability. Nickel is obtained almost exclusively from Canada, which for most purposes may be treated as equivalent to a domestic source. Known Canadian reserves are large, but annual output has lagged behind world needs despite intensive efforts to stimulate production. Cobalt, columbium, and tungsten move in world trade in relatively small bulk (shipments are measured in pounds), minimizing transportation requirements and making movement by air feasible. Nascent nationalism in the Belgian Congo offers a possible threat to the most important source of cobalt. The principal sources of columbium are also European colonies in Africa, with British-held Nigeria the primary supplier and the Belgian Congo again important. Tungsten is obtained from many countries, world wide, but the only foreign source which lies outside the primary strategic sphere of the United States[2] is the Republic of Korea. Chromium moves in bulk, with the principal suppliers far distant but for the most part politically stable and firmly allied to the United States.

Basic stockpile objectives for all seven metals have been met; maximum stockpile objectives have been attained, if all government inventories are considered (19). The undesirable effects of erratic and importunate stockpile purchases are illustrated by the large dips in both foreign and domestic production of tungsten and columbium in mid-1956. The futility of a policy which encourages domestic production at incentive prices for a stockpile designed to provide an emergency source of materials in the event of a loss of foreign sources seems apparent. The abrupt cessation of stockpile purchases on the open market is particularly undesirable when the economy of one weak country must bear the brunt of adjustment, as did Nigeria in the case of columbium.

The effect on materials market stability of even a relatively small economic downturn in the United States is illustrated by the large decrease in demand for the additive metals in 1938 as compared to the previous year. The decline was spectacular

[2] Usually identified as North America, the Caribbean, and northern South America.

in the case of nickel—50 per cent in one year. The demand for tungsten dropped so sharply in 1938 that it obscured the important loss in that year of China's total output to the Japanese.

The importance of the role of technology, which extends from improved exploration methods through the processing of low-grade ores to reclamation to more economical use and to development of substitutes, is demonstrated in several instances. As stated, United States dominance of vanadium production is incidental to the new methods of obtaining uranium, and a technically feasible process has been discovered for producing columbium, long the scarcest of the additive metals, from plentiful Canadian ores. On the other hand, the disruption of international trade has resulted in the loss again of Chinese tungsten and of other metals, such as Finnish cobalt, as well. Other nations, particularly those in western Europe, have suffered losses in materials supply as a result of the cold war and now compete with the United States in other areas in the search for an ever greater volume of raw materials.

V. *Materials Policy: Conclusions*

The vital importance of access to foreign raw materials for all nations was recognized in one of the clauses of the Atlantic Charter: "They [the Allies] will endeavor, with due respect for their existing obligations, to further the enjoyment by all states, great or small, victor or vanquished, of access on equal terms to the trade and to the raw materials of the world which are needed for their economic prosperity."

The moral leadership of the United States would be irreparably damaged by a complete lack of restraint in the purchase and use of foreign raw materials by overriding the legitimate import needs of allies and the uncommitted nations of the world. There are highly essential mutual objectives which necessarily influence the basic American position on the sharing of resources and their world-wide distribution. Not the least important of these is the reduction of the direct dependence of several nations upon aid from the United States (10, p. 157).

Further, in their drive for access to sources of supply, the United States and the other industrial nations should recognize the legitimate aspirations of the raw-materials-producing countries to derive significant benefit from their natural resources. Fair and reasonably stable materials prices, the establishment in the nation of origin of such processing plants as may be practicable, and the welcoming of native capital for joint ventures are but a few of many indicated policies.

International rather than unilateral action is best calculated to solve these complex problems, but the United States should be prepared to assume the major initiative for two reasons. First, the United States is the world's largest consumer and importer of materials. Inevitably, the effects of American resources policy will be felt in both materials-producing and materials-consuming countries. Second, the United States is the free world's major source of capital, equipment, technology, and management skills, all essential to both the promotion of materials production and the economic advancement of the less-developed areas (12, p. 59).

The United States historically has opposed international commodity control agreements but as a leader nation cannot afford to ignore the requirement for some regularization of procurement for at least those materials in critical short supply. Other industrialized nations are understandably disturbed by the accelerating depletion of the normal sources of their sometimes small but, to them, highly important

industrial materials requirements. Controls which would stabilize distribution patterns appear to them to be increasingly essential as a protection against the appetite of a consumer whose proportional share of world materials production is huge and continually mounting.

World War II operations by the Western Allies in joint control over raw materials furnish a body of applicable experience for international efforts in this field. The establishment of the International Materials Conference, led and hosted by the United States, indicates widespread realization of the international nature of this problem area. While formalized international controls embracing all materials and all nations are certainly unattainable, and probably undesirable, concerted action on a multination basis to deal effectively with existing or predicted shortages in perhaps a dozen critical materials seems both feasible and desirable (10, p. 161).

The basic problem in the field of foreign resources is to determine the measures best calculated to provide a flow of materials from the resources-rich but underdeveloped countries and at the same time to promote the balanced economic growth of these countries. Certainly, national security considerations affect the extent to which the United States should develop and depend upon foreign, as opposed to domestic, sources of raw materials. But, as has been stated, there is reason to doubt whether materials security is not too often considered in terms of previous wars. If the thesis posited earlier is correct, it can be argued with some logic that dependence upon imports of materials presents less a security problem than an opportunity for improving the leadership position of the United States in the free world. Materials imports can lessen the drain on domestic resources, provide exchange with which foreign nations can purchase American goods, aid in the progress of underdeveloped areas, and emphasize the interdependence of the nations involved in the trade.

Even if viewed in the narrower prospective of military preparedness in the conventional sense, stockpiling and other commercial policies designed to promote security should be reviewed in terms of more current concepts of vulnerability. Materials may be stockpiled at the source (e.g., petroleum in the field), as extracted raw materials, as semiprocessed goods, and as finished goods. The farther along in the process of production that an item is when stockpiled, the more readily available it is in an emergency. The storing of processed materials amounts to including lead time and labor, power, and equipment contributions in the stockpile. The general aim should be to approximate storage in the highest homogeneous form in order to accomplish as much processing as the need for flexibility will allow (9, p. 169).

Proper timing of stockpile purchases is of great importance. If the bulk of stockpiling activity is postponed or delayed until the initial months of a defense emergency, such activity will lessen rather than increase the efficiency of production of military goods. Stockpile purchases in 1951, while granted a lower priority than deliveries to industrial consumers, cut sharply into the flow of key materials. Stockpiling at that time was a factor in the serious shortages of nickel, cobalt, columbium, and molybdenum. All these metals could have been purchased for the stockpile in the years 1946–49 without disrupting the national economy (1, p. 137). Further, dubious stockpiling procedures have affected availability of foreign materials. Poorly timed and erratic purchasing has had great economic consequences for foreign as well as for domestic consumers and producers. Foreign producers may tend to view the stockpile as a surplus overhanging the world market and hence be loath

to expand materials production when required. The "buy American" clause in current legislation is incongruous if the chief purpose of stockpiling is to acquire an emergency supply of materials that usually must come from abroad. If encouragement and support of domestic materials production is deemed desirable, it can be accomplished by such devices as subsidies and price premiums for specific commodities.

Import tariffs and quotas, while less important in the materials field than in other areas of international trade, have nevertheless played a part in the disappearance of the all-embracing world materials market which was of such importance in the tremendous economic growth of the last century. The justification for such taxes when not attributed to military security needs is based on unemployment psychology. In addition to the international ill will that such trade barriers generate, they have a cumulative ill effect on world trade and world production. The nation imposing high tariffs and import quotas is likely to find sales abroad as well as purchases abroad reduced. The United States has much to gain and little to lose from the elimination of import duties on all raw materials and preferably on most materials at an advanced state of production.

Nothing has gone farther in calming recent fears concerning the depletion of resources than the great surge of technological advancement. Garret put it this way: "Twenty-five years ago the power of science and technology to effect higher utilization of natural products and so reduce waste was underestimated. The case today is that this power is thought to be magical" (22, p. 809).

Technological innovation and social incentives for both increased production and checks on waste are needed. Social institutions of all types within the nation greatly influence the rate of resource consumption and, therefore, the possibilities of conservation, but, in the long run, it is likely that nothing can obviate the need for government regulation of resource utilization. Conservation in its widest application involves a three-pronged attack: first, an attempt to reduce or eliminate overconsumption directly by both informal and formal social controls (successful curtailment of use of resources in an improvident way may require a reorientation of legal philosophy in keeping with economic and social changes); second, an attempt to encourage a preference for those uses of particular commodities which take fullest advantage of their peculiar fitness for certain tasks (crude oil, for example, can be burned under a boiler in competition with coal or further refined and used in ways with which coal cannot compete); and, third, an attempt to establish a preference for the use of *flow* resources—water, vegetation, sunshine, and the like—over *fund* resources (22).

In the past, with few exceptions, the free price system has determined the use and distribution of materials resources in the United States. Continued reliance, certainly exclusive dependence, on market forces and private initiative for this function perhaps is unfeasible. It is difficult to envisage large shifts in demand or radical reduction in the rate of exploitation of resources in the United States without conscious interference with the free play of economic forces. If conservation were identical with economy, more reliance could be placed on the moving forces of the economic price system. If the essence of conservation is the sacrifice of certain economic interests on behalf of posterity, then the profit motive must be supplemented by social controls.

The United States still has an enormous wealth of natural resources, but recent rates of drain and the prospect of further increases in demand are just causes for concern. The combination of population growth,

rising economic activity, technological innovation, and the increasing equality of living levels among both individuals and nations exert ever greater pressure on world materials resources. It seems certain that domestic and world materials requirements will continue to increase, and this certainty is matched by the uncertainty to be found in the whole complex picture of world materials supply. The development of a comprehensive national materials policy involves consideration of an extraordinarily wide range of problems: the benefits and costs of expansion of domestic production versus investment in foreign sources of supply; the question of the political and military vulnerability of foreign versus domestic sources; the needs of our allies and the uncommitted states to have access to materials vital to all nations; etc.

An adequate materials policy for the United States must be based firmly on national objectives and provide a comprehensive framework for both public and private programs, but at the same time it must be realized that there can be no purely domestic policy toward raw materials that all the world must share.

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Some bases of West German military policy

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Chancellor Adenauer of West Germany startled the world on December 3, 1949, with the statement that the German Federal Republic would be willing to consider a military contribution to the defense of western Europe provided the Allies so requested. A few days later he indicated to his party, the Christian Democratic Union of North Rhine–Westphalia, what had prompted him to take this step so fraught with political liabilities:

> It should not be forgotten that Germany, too, has a claim to security. . . . The Western Powers should not overlook the fact that Germany is not a vast and empty desert which can be conveniently used as a theater of war, but a densely populated country. The Western Allies must face the question: which danger is the greater, the danger threatening from Russia, or the prospect of a German contingent in a European army destined to defend Europe [29, pp. 308–11]?

Thus the Chancellor launched the great German rearmament debate.

Later, German rearmament was linked to such themes as the establishment of a European federation, German reunification, and the restoration of German sovereignty. The security of his country, however, was the Chancellor's primary concern. As he said: "To my mind it is impossible, nay irresponsible, to allow Germany to remain any longer in an insecure position" (1, p. 20). Concern over the Czechoslovakian coup, the Berlin blockade, and the brigading of police formations in the Soviet Occupied Zone was not merely limited to the occupying powers.

The trouble was that there was no evidence that the apprehension over Germany's security, expressed unofficially in Allied quarters, was seeping up to the official level. The Petersburg Agreement of November 22, 1949, had manifested the Western occupying powers' continuing concern for German demilitarization. The meeting of the Atlantic Pact defense ministers on December 1, 1949, had produced no change in the strategy for the defense of Europe. The Rhine River was still the first line of defense. During the next six months, Herr Adenauer pressed the Western Allies for a positive commitment to defend West Germany. The invasion of South Korea confirmed his worst fears. This overt act set events in motion which culminated five years later in the acceptance of the Federal Republic of Germany into NATO with a mandate to contribute a force of up to 500,-

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000 army, navy, and air force troops to the defense of western Europe.

It might be argued that, given the policies of the powers to which the Federal Republic was subordinate, no solution was possible other than the one which finally evolved (2, pp. 6–7). But how compatible was this solution with West Germany's capabilities and the other major tasks of economic and social improvement which the government considered essential? Did the limits to the Federal Republic's freedom of choice established by the government's apperception of the Republic's capabilities complement the limits imposed by the facts of international politics?

It seems to me that there was such a complementary relationship. The result has been that West German policy has remained basically unchanged in spite of the Federal Republic's attainment of full sovereignty and freedom of action. Assuming an unchanged threat, or definition of that threat, the facts of Germany's geographic layout, the relatively inelastic distribution of demands on the national effort, and the continuing revolution in military technology suggest that German policy is likely to persist in the same vein.

I

What are the major areal limitations which West German statesmen have confronted in the development of the country's security policy? This question will be considered under the following general headings: layout, economy, and demography. The position of West Germany in Europe and its areal structure are the principal topics under the first heading; resources, trade, and budgetary allocations, under the second; and the population and its attitudes toward rearmament, under the third. No attempt will be made to exhaust these categories. Only some of the more important limiting features of each will be depicted.

LAYOUT

German military strategists visualize Europe as a peninsula of the Eurasian continent. From this point of view Europe's littoral commences in the Baltic and ends in the Black Sea. This peninsula is relatively small with respect to the continent as a whole, and western Europe lies at its tip. Egress from the Baltic and Black seas to the open ocean is constricted. Such Soviet naval craft as might be dependent on bases on these two seas would be ineffective as long as the Kattegat and the Dardanelles remained in Western hands. Soviet efforts to modernize its undersea vessels and develop bases in climatalogically less hospitable regions would reduce this liability. The Federal Republic is particularly sensitive to factors affecting the situation on its northern flank.

On land, West Germany occupies an analogous position to the countries standing astride the straits. To gain access to the balance of western Europe over land, the Soviet Union would have to use the territory of the Federal Republic.

From the point of view of terrain alone this would not be a particularly difficult task. In fact, the North German Plain is actually a portion of a broad avenue which extends from the Ural Mountains to the Channel coast. The going would be considerably more difficult across the waist of the Federal Republic. This region features the *Mittelgebirge*, but the area is not sufficiently mountainous to afford substantial impediment to troop movement. In the south there is no real obstacle to east-west movement up to the line of the Odenwald and Schwarzwald, which lie just to the east of the Rhine. Along the eastern border be-

tween Bavaria and Thuringia and Czechoslovakia the hilly country of the Frankenwald, the Fichtel Gebirge, and the Bayrischer Wald provides some basis for the delay of forces striving to move across Bavaria to the Rhine.

The canalization of the rivers has rendered them less effective as obstacles to ground movement than they might otherwise be. The most significant barrier to transverse movement is the Rhine, but the bulk of the territory of the Federal Republic lies to the east of this river. In effect it makes West Germany into a large bridgehead. Unfortunately, as we have seen, this bridgehead is bounded by no naturally defensible line on the east. Moreover, this line is some five hundred miles in length—a distance roughly comparable to that of the Western Front in World War I! This fact magnifies the lack of depth between the eastern border and the Rhine, a distance which could be traversed in ten hours by tank. It also renders precarious any dependence on the major North Sea ports of Hamburg and Bremen.

The political complexion of the countries contiguous to West Germany's eastern border complicates the defender's problem. Soviet occupation of Middle Germany, the territory of the so-called German Democratic Republic, has advanced Russian power to the heart of Europe. Czechoslovakia is a Soviet satellite. Sweden on the north and Austria on the south are neutral.

The Federal Republic, in sum, is extremely vulnerable to ground attack. It can count on scant assistance from the terrain to multiply the effectiveness of the defense. The Rhine, the Alps, the Pyrenees, and the English Channel all lie to the rear. For all practical purposes the balance of western Europe now comprises West Germany's military hinterland (10, 11, 20).

ECONOMY

Under the aegis of the Adenauer administration the economy of the Federal Republic has made an unexampled recovery from the ravages of war and pushed on to sustained record output. Social projects, however, have been the chief beneficiaries of the Federal Government's share of the national product. In his first speech to the Bundestag, the Chancellor stressed that the Government would be guided by its effort to establish social justice and alleviate want (29, p. 278). Priority has been given to a sound currency and a favorable investment climate. Production is double what it was before the war. Yet, while the federal budget has tripled since the Government began operations, the annual budget for military purposes has been only about 20 per cent higher than the figure once disbursed for occupation costs. The Government has been extremely careful to insure that the burden on rearmament would not disrupt the booming economy or jeopardize social outlays.

In terms of natural resources, West Germany is not a wealthy country. The only raw materials produced in quantity are fuels. These constituted 89 per cent of the total value of the country's raw-material production in 1955. In that same year the Federal Republic had to import 70 per cent of its industrial materials.

West Germany's dependence on food imports is proportionately much less. Here the Chancellor's emphasis on assistance to the agricultural sector of the economy has succeeded. The Republic has reduced its need for food purchased abroad from 50 to about 20 per cent (16, pp. 49–56).

As an indication of the degree to which these imports come from Western sources, only 1.4 per cent of all West Germany's foreign trade was conducted with the Soviet Union during 1957 (18, April 19, 1958).

This relationship highlights the importance of Germany's North Sea ports and the Rhine waterway. The German merchant marine has expanded accordingly. By 1958 the fleet aggregated four million gross tons —larger than it had been before World War II (18, July 30, 1958).

By 1957, approximately 21 per cent of the gross national product of roughly 50 billion dollars was devoted to foreign trade. By the following year West Germany's net reserves of gold and foreign exchange amounted to more than 5 billion dollars (18, March 25, 1958).

The basic economic policy of the Government is to preserve internal economic stability, a sound currency, and the favored position of the country's industry (5, p. 244; 6, pp. 1–2; 13, pp. 6–7; 16, p. 7). This policy has been exemplified in the budget and in West Germany's cautious approach to a *large* program of foreign loans, which, it is claimed, would stimulate inflation and siphon off funds required for internal investment (18, March 25, 1958). The Government strongly feels the need for assisting economically weaker countries but prefers to help by creating the prerequisites for private initiative rather than by direct federal aid (19, December 1, 22, 1959).

Investment has been heavily emphasized. Between 1950 and 1955 it ranged from 19.9 to 28.5 per cent of the national income (5, p. 67). This factor has undoubtedly contributed a great deal to West Germany's rapid economic growth. Capital has been accumulated at a higher rate, relative to industrial output, than in Great Britain (16, p. 70).

What has been the result? In the first decade of the Republic's existence national income rose from DM. 74.5 billion to DM. 178 billion. Per capita income increased 78 percent; real income, 56 per cent. Six million new jobs were created, and the number of employed, 25.2 million, was almost half the total population (18, December 21, 1959). Note that this achievement was accomplished by an economy largely devoted to producing non-military goods.

Between 1949 and 1957 an estimated four million dwelling units had been constructed, more than wiping out the deficit of about 2.3 million units destroyed during the war. The pace of new construction promises to continue to try to catch up with the yet unfulfilled demand (19, July 21, 1959).

As a result of the large volume of destruction in Germany and its late start in postwar recovery, Germany's population still has a standard of living about 20 per cent less than that of the people of Great Britain between 1953 and 1956. Part of the reason lies in the fact that the agricultural labor force in the Federal Republic is four times that of Britain, although agricultural output is only 50 per cent higher in Germany (16, pp. 23–25). Undoubtedly, per capita output would have been higher had it not been for the flood of expellees and refugees (13, p. 20). On the other hand, without these additions to the labor force, the pace of industrial expansion would have slowed. With production achieving new highs, unemployment in October, 1959, had dropped to an irreducible 0.9 per cent.

The Germans have worked hard. A third of the labor force still works more than 48 hours a week. Another third works between 48 and 45 hours a week, while only the remaining third works less than 45 hours.[2] Recent labor opposition, however, to such a long working week threatens to aggravate the shortage of industrial manpower (19, December 1, 1959). Over the objections of

[2] By comparison the weekly average in Britain is about 46 hours; in the United States, 41 hours (18, September 15, 1959).

both the Government and the Federation of German Employers' Associations, the German Trade Union Federation has adopted a demand for a 40-hour week (19, September, 1959).

The will to work has been matched by union restraint in its wage demands. As a result, although the average monthly wage of the West German worker has risen from DM. 222 to DM. 420 and pensions have tripled, real wages, as noted above, have increased markedly over the prewar level (19, September 15, 1959).

Under the Adenauer regime the broad system of social security has been extended. An estimated 44 per cent of the federal budget for the fiscal year 1958–59 was earmarked for pension payments, social insurance programs, support for war victims, unemployment relief, restitution to victims of Nazi persecution, and housing. The costs of defense and government operation each absorbed 27 per cent.[3]

For the past several years Bonn's defense budgets have averaged about DM. 10 billion. The planning figure, which the Government does not like to exceed, is DM. 9 billion. Actually, procurement difficulties have held annual defense spending down to about half the appropriated amounts. Hence the net burden of the military establishment on the economy has been somewhat less than 2 per cent of the annual gross national product.[4]

The stern ceiling on defense spending, which is not much higher than the average yearly maintenance costs to the Federal Republic for Allied troops from 1951 to 1954, is deliberately designed to promote fiscal and social stability. Admittedly, the Defense Ministry has consistently left unspent significant amounts of the funds appropriated by Parliament, and in that sense the point, perhaps, is academic. One must, nonetheless, take the Minister of Economics, Dr. Ludwig Erhard, seriously when he says that rearmament must be organized to avoid upsetting West Germany's free social system. In order to preserve fiscal stability, rearmament is to be financed exclusively through taxes. Added military expenditures will be possible through increases in the national income. "If the Federal Republic continues [to increase its income]," according to Dr. Erhard, "it should be in an increasingly better position to meet the needs of defence without detriment to its obligation to increase the standard of living of the German people and, above all to increase social services. The expansive force of our economy creates the best conditions for success" (5, pp. 198–200).

The question of developing a domestic arms industry is likewise linked to the problem of economic growth. Except for articles used in common by civil and military sectors, such as transport equipment and clothing, the production of military hardware would require the conversion of existing plant or the construction of new facilities. Such a commitment, in turn, would entail the diversion of capital and manpower, which is ready at a premium, with consequent deleterious effects on economic growth. The economists, therefore, have argued for European collaboration in arms production.

DEMOGRAPHY

A modern military establishment is in direct competition with industry for the talent

[3] These percentages are calculated on the basis of figures supplied in the *New York Times*, March 9, 1958.

[4] DM. 8 billion was spent in fiscal 1958; DM. 9 billion was budgeted for 1959; DM. 10 billion has been requested for 1960 out of a draft budget of DM. 41.9 billion. To cover the 1960 budget, the Government expects to float loans of DM. 3 billion (19, pp. 1–2).

it needs to field an effective fighting force. Executive and technical skills of the same order are essential to both. The situation is particularly difficult in West Germany, where the society will be hard put to furnish the quantity of personnel required, much less the quality. A report by the Federal Ministry of Labor in 1957 warned that the requirements for an estimated 7 per cent increase in the gross national product could be met only by a 3.5 per cent increase in productivity (19, May 21, 1957).

By 1956 the population of West Germany had reached 50.6 million, an increase of 30 per cent for this portion of Germany over the figure for 1939. During this period the population density rose from 160 to 206 persons per square kilometer. The bulk of this increase stemmed from immigration. The net reproduction rate approximates unity. Hence there is virtually no natural increase.

Postwar German immigration into the Federal Republic emanated from the Soviet Occupied Zone, territory of the former Reich under Russian and Polish administration, and the countries of eastern Europe. The people from the Soviet Zone, who fled from their homes, are termed "refugees" to distinguish them from the Germans who were driven from Soviet and Polish Germany and eastern Europe, who are termed "expellees."

The demographic effect in West Germany of the two types of influx was quite different. Immigration from the Soviet Zone alleviated some of the most severe deficits in the population structures caused by the war. It added a number of young, unskilled workers to the population of the Federal Republic. In contrast to the youth of the average refugee, the demographic structure of the expellee group *paralleled* that of the native inhabitants of West Germany. Whole families moved as units.

The difference between the two groups exacerbated the problem of assimilating the expellees. Moreover, the expellees almost at one stroke added 20 per cent to the population of West Germany. This movement occurred at a time when conditions in the Western occupied zones were most trying.

In spite of these difficulties the expellee group has made positive contributions to the Federal Republic. The economic and social indexes of this group have shown distinct improvement, and particularistic political activity has lessened. Its presence certainly has contributed to West Germany's phenomenal economic expansion.[5]

The implication of this fact for the overall homogeneity of the population is extremely favorable. Maintenance of separatist tendencies by such a large proportion of the populace could have had a divisive impact on the society as a whole. Continued economic depression of this group could have added a significant radical dimension to German politics. The effectiveness of the Government in marshaling the people in support of its Western orientation could have been drastically reduced.

In a country the size of the Federal Republic the manning of an armed force of 350,000, the projected target for the Bundeswehr by 1961, ought not to be a burdensome task.[6] With full employment, however, the decision on the number of men to remove from the labor force is very important.

[5] This portion has been digested from the article by Dudley Kirk (13, pp. 3 ff.). The flow of refugees from the Soviet Zone continues at a rate of 2,000–3,000 per week. The annual increment to West Germany's population from this source, then, lies between 100,000 and 150,000 persons.

[6] According to this report the figure of 350,000 is to be distributed between the services as follows: army, 200,000; air force, 100,000; navy, 25,000; territorial defense, 25,000 (31).

On the other hand, the number of young men attaining the age for military service limits the temporary service base of the armed forces. The length of temporary service also has an important bearing on the size of the base. In West Germany the term is fixed at one year. The over-all demand on this base is a function of the number of regulars. According to the Federal Government, the policy is to keep the Bundeswehr at a high degree of professional service 18, February 9, 1958). If it is assumed that this implies a figure of 60 per cent regular soldiers,[7] there would be an annual requirement for approximately 144,000 conscripts.

On this basis, West Germany would be able to sustain the Bundeswehr. The number of draftees, however, would be proportionately high. If it is assumed that an average of 50 per cent of males attaining the draft age of nineteen would be fit for military service, an estimated 130,000–240,000 young men would become available each year for the next ten years (12, p. 231).[8] This would imply a draft rate of from 30 to 55 per cent of the *total* annual crop of nineteen-year-olds. A longer term of service would reduce this impact correspondingly or provide a basis for modest expansion of the defense establishment.

This relative shortage of young men means that any substantial augmentation of the Bundeswehr would have to be purchased at the price of increasing its professional component. Based on the NATO average (in 1956) of 1.6 per cent of each member country's manpower under arms, West Germany, with a population of fifty million, theoretically could field a force of 800,000. Even if the length of conscript service were to be doubled (a most unlikely event), the professional component of the Bundeswehr would have to be tripled to attain such a figure. Such an effort would imply establishment of service emoluments sufficient to attract about 2 per cent of the best elements in the German working force. With 7 per cent of 1960's budget slated to be covered by deficit financing, it is not hard to see that any appreciable increase in military expenditures would require a major change in the political climate. Capacity is of little moment without the will to use it.

Rearmament has not been at all popular in Germany. The Social Democratic party, with the consistent support of about a third of the electorate, has doggedly fought rearmament from the very beginning. At its rally in 1956 the S.P.D. for the first time formally advocated the defense of a free democratic order and adopted a positive attitude toward national defense as such.[9] Numerous opinion polls have clearly indicated the existence of a hard core of opposition to rearmament in any form (17, pp. 355–62). This fact, however, must be balanced against Chancellor Adenauer's unprecedented electoral successes in 1953 and 1957.

The younger generation, on whom the burden of service would fall, shared the popular disdain for the military. Replies to a series of questions in 1956 suggested that the over-all attitude of this group might be one of grudging acceptance. Forty-two per cent of the youth between fifteen and forty-five years of age were ready to serve if necessary, 28 per cent were happy to serve,

[7] The assumption of 60 per cent over-all is based on a 50 per cent figure for the army and 75 per cent for the navy and air force (25, p. 9).

[8] The actual requirement for draftees may be reduced if the experience factor of 25 per cent of the draftees volunteering for an additional six months' service persists.

[9] This declaration was incorporated into the party's first general revision of its program in thirty years in November, 1959 (19, November 17, 1959; 27, p. 2).

and 28 per cent were unwilling to serve at all (28, pp. 36 ff.). The report of the Defense Ministry on the release of the first 10,000 conscripts from their year of active service supported this impression: these young men had done their duty manfully but unenthusiastically. Other factors indicative of this attitude were the willingness for an extra six months of service (18, April 16, 1958), and the negligible number of conscientious objectors. This figure amounted to less than 1 per cent of the 100,000 nineteen-year-olds screened for service (7).

The Government's decision to go beyond the initial terms of reference of rearmament by preparing the Bundeswehr to function in atomic warfare aroused strong opposition. The S.P.D. endeavored unsuccessfully to take the issue to the country in a referendum following the Bundestag's approval of a resolution, March 25, 1958, which contained the following paragraph: "In agreement with the requirements of the NATO defense system and, bearing in mind the potential opponent's rearmament, the armed forces of the Federal Republic must be equipped with the most modern weapons to fulfill commitments assumed in NATO" (18, March 26, 1958).

The S.P.D. apparently had a solid foundation in public opinion for the determination with which it pushed its attempt to defeat the Government on this vital issue. A survey by the Emnid Institute had ascertained that 74 per cent of the sample were opposed to the establishment of missile bases and the stockpiling of atomic weapons in West Germany (3, p. 31).

Polls also showed the West Germans to be unenthusiastic about the Government's firm adherence to NATO. The Duesseldorf Intermarket Public Opinion Institute determined that only 32 per cent of the people queried would favor a firm alliance to the West, as against 34 per cent who would prefer ties to the West *and* the East within a European security system and another 20 per cent who would like to see a completely neutral Germany (3, p. 31).

The S.P.D. confidently made the atomic-arms question the major issue in the *Land* election on July 6, 1958, in North Rhine–Westphalia. As the Federal Republic's most populous *Land*, the success of the Christian Democratic Union there was certain to be interpreted as an indication of the strength of the Chancellor's Government. In addition to having to fight the electoral battle on such a stormy issue, two other factors put the C.D.U. at a disadvantage: it was out of power in North Rhine–Westphalia and it was left leaderless in the middle of the campaign after the sudden demise of its able chief, Karl Arnold.

Chancellor Adenauer personally took the road to stump for his policies. Once again, Herr Adenauer's power as a vote-getter was dramatically demonstrated. Final returns gave the Christian Democratic Union an absolute majority of 50.5 per cent of the vote, for a 9 per cent increase over its total in the previous *Land* election in 1954. The Socialist–Free Democratic coalition parties barely held their own. Together they polled 46.3 per cent of the vote, for a nominal gain of 0.3 per cent (18, July 7, 8, 1958). Once again the S.P.D. had failed to gain power on the rearmament issue. However, the strength of the adverse sentiment was something which the Chancellor could not well ignore. As elections go, the margin of victory was slim.

II

How were these areal factors taken into account in devising the security program of the Federal Republic?

Given the definition of the threat, there were two basic choices which a security program could be designed to support. The

Federal Republic could pursue a neutral course or it could align itself with the West.

The Chancellor rejected both an unarmed or "paper" neutrality and a genuine armed neutrality on the Swedish or Swiss model. Two world wars amply demonstrated that the neutrality of any country would not be respected if a belligerent deemed it advantageous to violate that neutrality. The central geographic position of Germany would make such a shield worthless in the event of hostilities. The Swedes and the Swiss based their calculations on their geographical positions, which were totally different from Germany's, their armed forces, and their hope that their countries would not be worthwhile objectives. "None of these conditions," the Chancellor has pointed out, "holds true for the German Federal Republic. . . . As for defending our neutrality by our own strength in case a hot war started between East and West—of that we are simply not capable either economically or in armaments in the age of atomic weapons and the commanding role of air power" (1, p. 58).

Just as the Chanceller took a historical view in revealing the bootlessness of passive neutrality, so did he look to history for instruction on the value of alliances. He asserted that the Federal Republic could not exist without the support of other states. Germany's geographical position was politically unfavorable. Her situation in the heart of Europe and unprotected borders had forced her to look for allies ever since the time of Bismarck. He considered that the aims of NATO, those pertaining to defense being particularly important in view of world tensions, were "in full harmony with the natural interests of the German nation" (1, pp. 55 and 126).

He looked beyond the era of America's atomic superiority to the time when the Soviet Union would have caught up to the United States. He anticipated improvements in the defense against atomic weapons which would reduce their "crucial significance." At such a time traditional war potential would once again be important. The power of the Eastern bloc, however, was such that the European nation-states were no longer able to guarantee their own territorial integrity (1, pp. 45 and 53). The Chancellor equated the end of NATO with "the end of freedom for West Germany." He was convinced that the neglect of self-protection would lead to "war and subjugation" (23, p. 2).

The Chancellor's military advisers provided the strategic rationale for this line of policy. General Adolf Heusinger, inspector-general of the Bundeswehr, asserted that the defense of Europe must be considered as a unified whole from the Persian Gulf to the North Pole. In this area it would scarcely be possible for the Soviet Union to conduct a localized attack because of the vulnerability of its flanks. However, the territory of the Federal Republic was decisive for the defense of Europe because of its central location and the lack of depth of the balance of the West European peninsula. The defense of the Low Countries and France would be questionable, since in terms of modern warfare the Rhine is no longer such a formidable obstacle. Italy would be cut off and Denmark lost. The Soviet submarine fleet would be in position to operate against Western ocean communications. Such operations would threaten the flow of supplies essential to the rest of Europe (11, p. 2).

In general, German soldiers visualized that a major war in Europe would start with a sudden, massive onslaught of all types of forces against the entire area of the Federal Republic. Simultaneously, suppressive attacks would be aimed at Western

long-range atomic delivery systems. Secondary attacks would be directed at Scandanavia and the Balkans to protect the flanks of the main thrust across the North German Plain and to secure the outlets of the Baltic and Black seas (4, 9, 10, 14, 20, 21).

Limited war is considered to be a possibility, but its likelihood is deemed to be slight if the Alliance holds firm. The Federal Minister of Defense, Franz-Josef Strauss, has pointed out that the Bundeswehr is being developed to cope with local attacks without reliance on atomic weapons. He placed special emphasis on West Germany's vulnerability to such attacks by virtue of her geographic situation in contrast to that of Britain. The basic idea is to exploit the principle of deterrence to the maximum. Herr Strauss has emphasized that the Russians must be forced to realize that the West, including the Federal Republic, is so strong that the path to military expansion in Europe is definitively blocked (15, p. 21; 22, p. 141).

The Bundeswehr, which is designed to support this idea, was originally scheduled to be a "conventional" force of all three branches—land, air, and sea. The bulk of its initially planned strength of 500,000 was to be army troops. A small tactical air force and an even smaller navy for coastal defense rounded out the establishment.

From the outset it was not projected to be a national army in the sense of being self-sufficient from the factory through the logistic system to the firing line. Rather it was tailor-made as a contingent of an integrated, international force to execute specific strategic tasks. In consequence the Bundeswehr did not need to comprise a "balanced" force of all arms and services. It was hardly necessary for West Germany to furnish long-range bomber (or missile) formations or heavy naval craft.

Taken together, these factors meant that the Federal Republic would be able to reinforce NATO where strength was most needed, up front, on the ground, without undertaking a disruptive arms burden. Were the Bundeswehr not an integral part of a supranational force, an army component of 34 brigades (roughly the equivalent of 12 divisions) out of the revised program of 350,000 troops would be a remarkable feat in modern military terms.

Similarly, it made little sense for the Federal Republic to furnish a NATO contingent equipped to fight World War II. In October, 1956, little less than a year following the induction of the first volunteers for the Bundeswehr, Chancellor Adenauer took the first step in revamping his defense program. Over the objections of military advisers and his Defense Minister, Theodor Blank, he reduced the term of draftee service from eighteen to twelve months. He replaced Herr Blank, the architect of German rearmament since its inception in 1950, with Franz-Josef Strauss, who as a minister without portfolio had been in charge of atomic affairs in Dr. Adenauer's cabinet. Under Herr Strauss's energetic guidance the Bundeswehr was made over into a modern military force capable of fighting under atomic or non-atomic conditions of war.

The West German Government declared its readiness, NATO willing, in the spring of 1957, to put the Bundeswehr on an atomic footing (19, April 18, 1957). NATO gave its blessing in December, 1957,[10] and

[10] See the communiqué issued at the end of the North Atlantic Council meeting, December 19, 1957 (18). On February 25, 1958, General Norstad stated that atomic weapons for the German army were "absolutely indispensable" (18, February 26, 1958). At their meeting, April 15–17, 1958, the NATO defense ministers approved a master five-year plan for the defense of the West. The plan called for increased strength in the ground forces in Europe, including tactical nuclear weapons (18, April 18, 1958).

the Bundestag approved the Government's resolution authorizing the Bundeswehr to be equipped "with the most modern weapons" (19, April 1, 1958). The Chancellor's argument in the course of the stormy debate which preceded passage of the resolution is instructive:

> The Soviet Union . . . has pushed forward development in armament techniques with all means at her disposal. She is equipped with nuclear weapons and rockets. If the Federal Republic refuses to make use of progress in armament techniques should the strategic planning of NATO demand it, the Federal Republic would find herself *excluded* from NATO [19, March 25, 1958]. [Italics mine.]

Shortly, the Government announced the sweeping organizational changes in its armed forces necessary to implement this policy. Two important guidelines for the reorganization were stated as follows: "1. The Army must be in the position to accomplish defense tasks with both traditional and modern weapons; 2. Maximum fighting power must be achieved with minimum manpower" (19, June 24, 1958).

The Government had already shown that it meant what it said by an announcement on February 26, 1958, of a cut in the programed strength of the Bundeswehr from 500,000 to 350,000 (18, February 28, 1958). The logical basis of the cut lay in the so-called Radford Plan, which United States Secretary of Defense Wilson had euphemistically described as "a bigger bang for a buck."

Some such cut, however, was necessary in view of the resources which the Federal Government was prepared to give the Bundeswehr, on the one hand, and the rate at which the Bundeswehr was able profitably to use those resources, on the other. The factors of manpower scarcity, procurement difficulties, and shortage of troop housing, which stemmed in part from the priority given the non-defense sector, led to the adoption of less ambitious targets for both the size and the date of completion of the Bundeswehr buildup. Procurement programs were necessarily in a state of flux pending determination of the organization for the Bundeswehr for both atomic and non-atomic warfare and implementation of the shift of the Bundeswehr's supply base from America to Europe. Time was required for ratification of the new program on both the national and the international levels.

The Chancellor's decision not to fight for the eighteen-month term of compulsory service had an immediate effect on planning for the Bundeswehr. In effect it cut the supply of potential draftees by one-third. It also implied the need for an increased number of permanent personnel because of the reduction of time available for the draftee to acquire military skills. The first reaction of the Defense Ministry was to announce a reversal in the proportion of permanent to temporary soldiers. The new ratio was to be 60 per cent permanent to 40 per cent temporary (19, October 18, 1956). Still, this ratio would require a temporary element of some 200,000 conscripts. Even this change implied maintenance of the high draft rate called for by the original plan for 270,000 conscripts. Thus, in a good "demographic year," the Bundeswehr would have absorbed virtually all the fit young men coming of military age in that year.

This change thus brought planning into line with optimum draft manpower expectancies, but it only exacerbated the problem of securing permanent personnel. Early during the buildup phase the Defense Ministry had received well over 250,000 applications from former soldiers of all ranks. Of this number, however, only 50,000 could be accepted. By the end of 1958, three years after the first volunteers had been sworn in, the Ministry had received approximately 200,000 applications from

volunteers without prior military service, of which only about 75,000 were acceptable. The total of these two figures, 125,000, made even the objective of 60 per cent professional soldiers in a Bundeswehr 350,000 strong seem difficult of achievement. The situation was particularly severe in the case of personnel with needed technical skills. As in other countries, the Bundeswehr could not compete financially with the more favorable terms of employment available in civil life (26, p. 6).

Added to this very real personnel problem was that of material procurement. The basic difficulty was the complete absence of an arms industry. West Germany might obtain its initial military kit through the United States Military Assistance Program. Replacement of that equipment was another matter. At stake was the question of just how self-sufficient the Federal Republic was to be for its military hardware.

Two factors made the answer to the question of the desirable degree of independence in arms production a difficult one indeed. Huge capital investments would be required to convert existing appropriate production lines or to build new plants for virtually non-existent capacity, such as for aircraft or missiles. On the other hand, the supply line for material procured abroad might be anywhere from a few hundred to a few thousand miles. Depending on the course of hostilities, foreign procurement might or might not be a disadvantage. Clearly, however, the Federal Republic was in an exposed position and had to reckon with the possibility that productive facilities might fall into enemy hands.

The recent purchase agreement by the Federal Republic for the Lockheed F-104 fighter aircraft for the Luftwaffe is a case in point. The Defense Ministry proposed to purchase 96 complete aircraft and build 200 more in the Federal Republic under license with blueprints and technical assistance from Lockheed. Economists, such as Minister of Economics Dr. Ludwig Erhard, objected that the hundreds of millions of dollars needed to revive the moribund aviation industry could be better spent on the development of civilian industry. In this case a sum of 400 million dollars was required to give West Germany the capacity to produce these modern aircraft. Herr Strauss won his point with the argument that the planes could not be supplied and maintained efficiently from a factory 6,000 miles distant in California (5, pp. 201–2; 18, February 22, March 29, 1959).

Faced with this dilemma, it is no wonder that West Germany has pressed at every opportunity for the standardization of material in use in NATO. Political and technical military considerations aside—and these are of prime importance—it is much less expensive to put an item of hardware on as broad a productive basis as possible. West German efforts to interest the Netherlands in adopting the F-104 and the European consortium of Germany, France, and Italy to manufacture the American low-altitude, anti-aircraft missile, the Hawk, are good examples. Efforts are being made to develop a light "European" tank (25).

West Germany, however, has specifically rejected the development and production of atomic weapons as being beyond her "national financial potential." Similarly, West Germany has denied any interest in the production of heavy, long-range missiles. In the absence of a productive base, capital costs would be much too high (24, pp. 6 and 20).[11] Such an effort would also be foreign to Germany's NATO mission.

[11] Under the terms of the Western European Union Treaty, West Germany is prohibited from producing atomic, bacteriological, and chemical weapons.

It is well to understand that when Herr Strauss talks in these terms he is acting as a responsible politician. Major capital expenditures are not *intrinsically* beyond West Germany's capacity. The limitation here lies predominantly in the political sphere. At the present time West Germany aims at producing about 50 per cent of the value of her military requirements inside Germany (25, p. 18). This is a decision born out of adherence to the NATO ideal and to the unacceptable drafts which a more autarkic policy would make on investment funds for the civil sector. This is a decision which could be altered by the demands of economic nationalism, perhaps arising out of a severe business cycle in the Federal Republic. The attractive power of the dynamic German economy could gradually chip away at this policy.

Be that as it may, it is very dubious whether German strategists in good conscience would argue for military self-sufficiency. At one blow the territory of the Federal Republic could become a theater of war.

This type of reasoning led Herr Strauss to initiate steps to shift the Bundeswehr's base of supply from the United States to the European continent. Franco-German co-operation in technical military developments was initiated as early as January, 1957. Soon the Italians joined to make the grouping trilateral (24, pp. 5–6). From this modest beginning sprang the concept of European "co-production," which is receiving its first hard trial in the joint effort to build the Hawk missile (25, pp. 13–15). Herr Strauss admitted that the system in which the United States acted as the supplier had been the most efficient from the point of view of standardized equipment. But he stressed that Europe could not always rely on American financial help and material supply (24, pp. 7–8). The latter statement was a clear reference to the submarine threat to Europe's supplies and, perhaps, to the possibility that United States forces in Europe would be making great demands on available ocean tonnage. In other words, total reliance on American support was as militarily unwise as total reliance on West German support. A happy medium was required. The fifty-fifty allocation of defense contracts to domestic and foreign sources expressed this balance precisely.

In some cases, however, it did not prove expedient to strike such a neat balance between military-strategic dictates and the allocation of national effort. The question of troop housing is a case in point. The numerous *Kasernen* which dotted the West German landscape were for the most part occupied by long-term "guests." The Bundeswehr was literally without a roof over its head. At the beginning of 1957, the main obstacle to increasing the manpower of the Bundeswehr was the shortage of barracks (19, January 10, 1957).

The first reaction to this shortage was a rush program to step up construction. By January, 1958, however, the emphasis in planning had been changed to the re-use of old buildings. Refugees living in numerous *Kasernen* were to be found other quarters. This solution had the advantage of avoiding new land requirements in a country where land is at a premium. By 1961, the target date for the completion of the Bundeswehr's manpower buildup, 400 *Kasernen* were to be in use, 160 of which would be new construction (8).

During the period since the inception of discussion on German rearmament about four million housing units had been constructed. However, there was still a deficit of some three million units. By 1962 the Social Building Program of the Federal Republic was to have provided assistance

in building some 1.8 million new dwelling units. The budget for this purpose had aggregated some DM. 11.5 billion in 1957 and DM. 12 billion in 1958. By continuing the average rate of construction of over 500,000 units per year, the government hoped to end the housing shortage by 1963 (19, May 27, 1958, and July 21, 1959).

Clearly, there was no lack of construction capacity as such. Military requirements had to be fitted in so as not to disrupt the Federal Government's truly amazing record in providing its people with adequate shelter.

III

German statesmen are firmly convinced that security for the Federal Republic must be sought within the NATO framework. Apart from the strong moral convictions which incline these leaders to look to the West, important geographic, economic, and demographic factors underlie this determination.

The Bundeswehr can have no combat significance apart from the larger NATO structure, of which it is designed to be an integral part. It is manifestly impossible for a nation of fifty million to confront the Soviet bloc alone and unaided. Disregarding the political strictures on the size and nature of West German armed forces, the demographic and economic burdens would be extremely heavy. By the standards of the missile-atomic age, western Europe is a small area; within this space, the Federal Republic occupies an exposed position. The security of West Germany's vital overseas links and the North Sea coast is predicated on the efficacy of NATO naval forces. In short, stripped of its allies, the armed forces of the Federal Republic would lack both depth in which to operate and balanced air power and would be without supply, fuel, and atomic weapons.

These statesmen have recognized that the armed forces would have to be developed in the light of a political milieu characterized by general reluctance on the part of the members of West German society to support military forces and to jeopardize the continued development of the economy.

These considerations help to account for the West German emphasis on the development of a relatively small, predominantly professional force. Even with a Bundeswehr of 350,000, a potential requirement exists for over 100,000 draftees a year. Germany is already past the point where significant increases in the national product can be obtained by means of putting more people to work. Were West Germany to place 1.5 per cent of its populace under arms, as in the United States, it could double the presently planned component of NATO's forces. Such a step, however, would entail a longer period of compulsory service and diversion of resources from the civil sector. The German economy is already using all available manpower. With over-all governmental expenditures already about a fifth of the gross national product, a burden slightly higher than in the United States, any increase in defense expenditures would tend to be at the expense of the important welfare sector of the budget. Moreover, in the prevailing political climate this component of the budget is tending to expand rather than the reverse. Germany's current senior political leaders witnessed the collapse of the Weimar Republic in the aftermath of ruinous inflation and mass unemployment. In this sense the social and economic policies of the Federal Government may be construed as an attempt to correct the errors of the Weimar era, just as the Bonn basic law was a conscious effort to overcome the weaknesses of the Weimar constitution. Any increased German military effort would probably be within the framework of an expanding hori-

zon for all achieved by greater productivity.

Barring substantial alterations in the international political situation, basic West German military policy as enunciated by Herr Strauss is unlikely to change:

> The German Armed Forces are not a national army in the older traditional meaning of the word. We have no self-supporting armament industry; we have no such stock piles in Germany, and we have not within the German Armed Forces a collective system of balanced forces. . . . Our Armed Forces are built up according to NATO planning as a wheel of the whole NATO outfit [25, p. 25].

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A tentative evaluation of world power

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Throughout history the decisive factor in the fates of nations has usually been the number, efficiency, and disposition of fighting forces. This power has been in the hands of a few military leaders and has generally been used for direct military domination. Now, however, we are faced with a new situation. In spite of the existence of the hydrogen bomb and the perfected guided missile, the weapons of the nations are not overwhelmingly military, for the two major camps are unlikely, short of desperation, to seek a solution in war. Instead, these two groups are now engaged in a tactical, economic, and ideological conflict on a world-wide scale aimed at achieving paramount economic and political influence rather than at conquest. It follows that the weapons of the struggle are now more varied and depend on much more than major military and diplomatic leaders. It does, however, remain largely true that national influence bears a direct relationship to gross national strength; without that, the most exquisite statesmanship is likely to be of limited use. Even without nuclear war the outcome of the present rivalry will have a decisive, far-reaching, and possibly irrevocable effect on the lives of billions of people, now and far into the future. Consequently, the evaluation of the sources of any nation's strength deserves careful consideration.

The writer has attempted, therefore, to compile a blend of admittedly selected statistics and judgments to summarize and compare the over-all past, present, and future strength of various nations by giving a numerical value to all factors considered relevant, whatever their origin. The difficulties and shortcomings involved are obvious; although experts can describe a nation's military disposition, or its confidence and determination, or the nature and volume of production, or population trends in general terms with considerable accuracy, it is necessary to combine and compare different qualities by applying selective and subjective criteria in order to reach the desired over-all impression. Since it is impossible to claim absolute scientific detachment, it is pointless to complicate the statistics too far or to give a false impression of accuracy and attention to detail. With these reservations, certain key elements have been selected as representative indexes of productivity, industrial power, defensibility, and self-sufficiency. They have been chosen within the limitations of available statistics to come as close as possible to the general truth in all cases and places rather than as a summation of each and every complex modifying factor. Statistics themselves present a problem; the latest figures for some countries and some factors may not be immediately available, and it may be necessary to go back some while to get absolutely contemporaneous material. Some sacrifice of either realism or immediacy is unavoidable.

As a compromise, and to allow comparisons to be carried further than the scope of the present article, the source material is derived from two sources only—the United Nations *Statistical Yearbooks*, principally for 1958, and the *Statesman's Yearbook* for 1959, where this contains additional or significantly more recent information.

Four basic dimensions have been selected and then modified and added in order to show the interplay of other factors and to obtain a sum total representing an estimate of total national strength. The four are: (1) national economy, which includes the resources of agriculture, minerals, raw materials, and industry; (2) land and (3) population (both used advisedly to avoid the implications of *Raum* and *Volk*); and (4) military power. Together, these four factors cover the field of natural and human resources, but for most practical purposes, of course, they are interdependent.

Land is the simplest to consider. Sheer area is undeniably a potent factor; it contributes as much to the strength of the Soviet Union at the present time as it did to the weakness of Nazi Germany between 1942 and 1945. Room for dispersal and maneuver are considerable assets, and their value is enhanced if they are facilitated by the possession of adequate communications; empty space and inaccessible areas are virtually liabilities. For the purposes of this article, the basis of calculation is the national area in thousands of square kilometers. This figure is divided by 5, 10, or 20, according to the effectiveness of national occupancy, represented by a scale of population density, and still further reduced in most cases by a third, a half, or two-thirds, according to the excellence or otherwise of communications. This is measured by the proportion of railroad mileage to area. This is probably the fairest simple measure, since in many parts of the world roads do little more than feed or duplicate rail facilities.

Population in terms of manpower is another basic factor but not a simple one. Total numbers are only significant in that they include young people, the next working generation; this is generally a significantly smaller proportion in western Europe than elsewhere. Only those people between fifteen and sixty, the active working population, are considered here. Then, since food is literally a vital commodity, the number of the total population surplus to home-produced food supply is deducted, or the hypothetical number of people who could be fed by a food surplus is added.

A further set of factors is brought to bear, loosely termed "morale." Certain countries, through corruption, apathy, or poverty, do not mobilize their human resources effectively, while it seems certain, for example, that the momentum of Russian and Chinese industrial advance gains much from the single-mindedness of their peoples' desire for progress, and a similar effect is produced in most capitalist countries by the operation of economic incentive. Up to 50 per cent of the total working population may be added to represent this.

We should note that the vastly greater productivity of most workers in the Western, and in parts of the Communist, world is partly balanced by the fact that a much greater per capita consumption of food and goods is considered essential, working hours are shorter, and much wealth is diverted into consumer goods of little worth in increasing the strength of a nation. (In this category must be included much of the United States annual automobile production.) Similarly, the ability of much of the population of underdeveloped countries to subsist on much less than would be demanded as a minimum elsewhere is considered part compensation for the lower

yields per annum and in assessing the extent of overpopulation reckoned above. In spite of this, however, technical efficiency has now reached such a level of achievement in some parts of the world that a considerable further factor has been applied to the active working population on the basis of consumption of energy per year per head of the population, and measured in terms of tons of coal equivalent, to bridge the gap between the productivity of, say, an Indian peasant beset by all the difficulties of economic and social backwardness and, say, a Stakhanovite steelworker whose labor is assisted by the ultimate in capital, organization, and machinery. Consequently, the working population has been increased in some cases up to five times. Since industry is usually more productive and powerful than agriculture, the numbers employed in manufacturing are counted five times more. For this purpose, employment in service industries has been excluded, since this may mean anyone from a businessman to a barber.

Significant though it is in itself, it is clear that population need bear little relationship to resources, developed or latent. Perhaps the best guide to industrial strength is the production of steel and energy; either or both must be considered fundamental for most industry. Little can be accomplished without them, and they are essential for industrial expansion and diversification. Crude steel production in hundreds of thousands of tons per annum is added to coal and oil production in millions of tons and to hydroelectric energy converted into millions of tons of coal equivalent. Naturally, it is almost impossible to ascertain with any degree of accuracy the enormous strategic gain of the Communist countries, or of any efficient and determined dictatorship, in dispensing with supply and demand and the free-market economy, liberating for them an immense amount of capital, skill, labor power, and steel to produce capital goods such as trucks, tractors, and machine tools. As a rough makeweight, Communist industrial production, as defined above, has been doubled. If, as is probably true, more than double goes into strategic production, it must compensate for much basic construction such as railroads and bridges and for pioneer development still taking place in most Communist countries.

While absolute industrial production is a considerable asset, relative abundance is as important for industrial goods and raw materials as for food. Middle East oil is of great international significance because it is available for export to deficit countries, which in turn must be considered weakened by their dependence on an outside source. For each of four strategic materials—steel, oil, metallic minerals, and engineering products—a figure equal to 5 or 10 per cent of the combined steel and energy total given above may be added to or subtracted from that total to account for deficits or surpluses to present needs. In this way, the strategic advantages of self-sufficiency and industrial diversification, great sources of strength to the United States and the U.S.S.R. and of weakness to the European industrial powers which rely greatly on trade for most raw materials and many industrial goods, are taken into account.

The sum totals so far represent the contributions of the physical, human, and economic resources of a nation to its power and may show the particular sources of any nation's strength or weakness, balance or disbalance, in times of peace. But, whether we like it or not, national strength must still be considered enhanced by military preparedness. Ten times a nation's total military personnel in millions should be added to the non-military total. This is not in itself a very considerable factor and truly

reflects the relative unimportance of conventional weapons in assessing differences between the medium-sized powers, especially in different areas of the world. But, for the purpose of assessing true political power, the possession of nuclear weapons and the means of delivering them has been considered as at least doubling the sum total of all other factors taken together. In practice this really affects only three powers at the present time, but it is a useful method of emphasizing the great gap in world importance between the two leading powers and all other contenders and of illustrating the theoretical independence of action which the United Kingdom derives from its nuclear weapons. It can also be taken as giving an indication of what might happen to the balance of world power if one nation's means of delivering nuclear weapons were to become so obsolescent as to be virtually ineffective.

Table 1 shows two giant powers, each at least five times as strong as its closest rival. The United States is still in first place, with the Soviet Union second but incomparably closer than she would have been even five years ago; such has been the increase in her industrial and military potential. The secondary powers are the United Kingdom, by virtue of her industrial strength and her strategic bases overseas which make possession of nuclear weapons effective at the moment, and China, whose sheer area and numbers are being enhanced by controlled heavy industry growing at a startling speed. In the third rank are West Germany, industrially slightly ahead of Great Britain but without her strategic advantages; Canada, as yet a pale reflection of the United States but not yet at her zenith; Japan, severely circumscribed by population pressure and a lack of raw materials and markets; France, whose only hope of regaining a higher place in the hierarchy of world powers seems to lie not in industry but in the possession of nuclear weapons and a successful pacification and reorganization of her colonial territories; India, whose lack of industrial progress has prevented her not only from preceding but even from emulating China as the great mainland Asian power in spite of her compact and populous area and good communications; and Poland, the third Communist power. The fourth-class nations are Australia (a kind of isolated and underequipped Canada), Brazil (the chief Latin-American power), Czechoslovakia, Italy (in some ways the Japan of Europe), and East Germany. Still farther down the scale come Argentina, the Union of South Africa, Sweden, and Belgium.

These figures are only an approximation to the absolute and comparative power of any nation as viewed in the light of present-day circumstances. Thus they take little direct note of high standards of living or of textile industries. No attempt has been made to add up total Communist or non-Communist strength or to predict decisive margins. The method has the merit of flexibility (the dissatisfied reader can construct his own scale of values) and of adaptability (as soon as new statistics become available, it can be revised). The extent to which sweeping changes will have to be made must depend upon the effectiveness of any further moves toward European integration and the spread of nuclear weapons and missiles to such nations as Germany, Sweden, Turkey, Pakistan, or Australia.

TABLE 1

Key	Source	U.S.A.	U.S.S.R.	United Kingdom	China	West Germany	Canada	Japan	France	India	Poland
1. Area in square kilometers (thousands)	U.N., *Yearbook* (1958)	(7828)	(22403)	(244)	(9761)	(248)	(9974)	(370)	(551)	(3182)[b]	(312)
2. Area corrected for population density	U.N., *Yearbook* (1958)	(391½)	(1120)	(49)	(976)	(50)	(499)	(74)	(55)	(318)	(31)
3. Area further corrected for rail density	*Statesman's Yearbook* (1959)	*391½*	*373*	*49*	*325*	*50*	*250*	*74*	*55*	*212*	*31*
4. Working population in millions	See Explanatory Note 2	(67½)†	(75)*	(28¼)†	(200)*	(23)‡	(5¾)†	(48¼)†	(19½)‡	(110)*	(13)‡
5. Above, corrected for technical efficiency	U.N., *Yearbook* (1957)	(337½)	(225)	(117½)	(200)*	(92)	(28½)	(87)	(58½)	(110)	(39)
6. Plus five times manufacturing population	See Explanatory Note 3	(78)†	(60)*	(45)†	(20)*	(40)‡	(7½)†	(40¼)†	(27½)†	(9)†	(12¼)†
7. Plus factor for "morale," based on row 4	Estimated	(84)	(37½)	(8)	(100)	(11½)	(3)	(22)	(6½)	.....	(4)
8. Plus or minus food supply factor	U.N., *Yearbook* (1958)	(+22)	.....	(−22)	.....	(−6)	(+8)	(−14)	.....	(−20)	(−3)*
9. Total population factor (rows 5, 6, 7, and 8)	.....	*471½*	*322½*	*148½*	*320*	*137½*	*47*	*135½*	*92½*	*99*	*52½*
10. Steel production in metric tons per year (millions)	U.N., *Yearbook* (1958)[a]	(102½)	(549)†	(220)	(52½)	(280)	(46)	(126)	(141)	(17½)	(53)
11. Coal production in metric tons per year (millions)	U.N., *Yearbook* (1958)[a]	(468)	(348)†	(227)	(124)	(151)	(10)	(52)	(57)	(44)	(94)
12. Lignite production (5,000,000 metric tons per year)	U.N., *Yearbook* (1958)[a]	.....	(29)†	.....	.....	(20)	.....	.....	.....	.....	(1)
13. Crude oil production (million metric tons per year)	U.N., *Yearbook* (1958)[a]	(354)	(113)†	.....	(1½)	(4)	(24½)	.....	(1½)	.....	.....
14. Hydroelectricity in million tons coal equivalent	U.N., *Yearbook* (1958)[a]	(203)	(61)	(4)	.....	(20)	(119)	(87)	(38)	(9)	(1)
15. Total industry (provisional) (rows 10, 11, 12, 13, and 14)	.....	(2047½)	(1100)	(451)	(178)	(475)	(199½)	(265)	(237½)	(70¼)	(149)
16. Additional factor for directed economy	.....	.....	(1100)	.....	(178)	.....	.....	.....	.....	.....	(149)
17. Indexes of surplus or deficit: steel	Estimated	(+102)	.....	.....	.....	(+24)	(−10)	(−13)	.....	(−7)	.....
18. Indexes of surplus or deficit: oil	Estimated	.....	.....	(−45)	(−37)	(−48)	.....	(−26½)	(−24)	(−7)	(−30)
19. Indexes of surplus or deficit: minerals	Estimated	(+102)	(+220)	(−23)	(+37)	(−24)	(+20)	(−26½)	(+12)	(+7)	(−15)
20. Indexes of surplus or deficit: engineering	Estimated	(+102)	.....	(+45)	(−37)	(+48)	(−10)	.....	.....	(−7)	(−15)
21. Total surplus or deficit factor (rows 17–20)	.....	(+306)	(+220)	(−23)	(−37)	.....	.....	(−66)	(−12)	(−14)	(−60)
22. Revised industrial total (rows 15, 16, and 21)	.....	*2353½*	*2420*	*428*	*319*	*475*	*199½*	*199*	*225½*	*56½*	*238*
23. Military personnel (millions)	*Statesman's Yearbook* (1959)	*2.6*	*4.5*	*0.6*	*3.5*	*0.1*	*0.15*	*0.2*	*0.1*	*0.55*	*0.3*
24. Total civil factors (rows 3, 9, and 22)	.....	(3216½)	(3115½)	(625½)	(964)	(662½)	(496½)	(408½)	(373)	(367½)	(321½)
25. Additional factor for nuclear weapons	.....	*3242½*	*3160½*	*631½*	.....	.....	.....	.....	.....	.....	.....
26. Grand total (rows 3, 9, 22, 23, and 25)	.....	*6459*	*6321*	*1257*	*999*	*663½*	*498*	*410½*	*383*	*373*	*324½*
RANKING	.....	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**

[a] Rows 10, 11, 12, and 13 for U.S.S.R. are from the *Statesman's Yearbook*. Recession elsewhere makes United Nations figures (a year earlier) more suitable.

[b] Excluding part of Kashmir, de facto part of Pakistan.

TABLE 1—*Continued*

Key	Source	Australia	Brazil	Czecho-slovakia	Italy	East Germany	Argentina	Union of South Africa	Sweden	Belgium
1. Area in square kilometers (thousands)	U.N., *Yearbook* (1958)	(7704)	(8514)	(128)	(301)	(108)	(2778)	(2047)	(450)	(30)
2. Area corrected for population density	U.N., *Yearbook* (1958)	(385)	(426)	(13)	(30)	(11)	(139)	(102)	(22½)	(6)
3. Area further corrected for rail density	*Statesman's Yearbook* (1959)	*128*	*142*	*13*	*30*	*11*	*92*	*51*	*22½*	*6*
4. Working population in millions	See Explanatory Note 2	(4)‡	(18)‡	(6)*	(21½)‡	(8)*	(6½)‡	(5½)‡	(3¼)‡	(3¾)‡
5. Above, corrected for technical efficiency	U.N., *Yearbook* (1957)	(16)	(18)	(24)	(43)	(32)	(13)	(16½)	(13)	(15)
6. Plus five times manufacturing population	See Explanatory Note 3	(5½)‡	(11)†	(6)*	(25)‡	(14)*	(7½)‡	(4½)†	(5½)‡	(7½)‡
7. Plus factor for "morale," based on row 4	Estimated	(1½)	.....	(2)	(7)	(3)	.....	.....	(2)	(1½)
8. Plus or minus food supply factor	U.N., *Yearbook* (1958)	(+5)	(−7)	(−2)*	(−3)	(−1)*	(+8)	(+2½)	.....	(−2)
9. Total population factor (rows 5, 6, 7, and 8)	.....	*28*	*22*	*30*	*72*	*48*	*28½*	*23½*	*20½*	*22*
10. Steel production in metric tons per year (millions)	U.N., *Yearbook* (1958)[a]	(28)	(16)	(52)	(68)	(29)	(2½)	(17½)	(25)	(63)
11. Coal production in metric tons per year (millions)	U.N., *Yearbook* (1958)[a]	(20)	(2)	(24)	(1)	(3)	.....	(35)	.....	(29)
12. Lignite production (5,000,000 metric tons per year)	U.N., *Yearbook* (1958)[a]	(2)	.....	(10)	.....	(43)	.....	.....	.....	.....
13. Crude oil production (million metric tons per year)	U.N., *Yearbook* (1958)[a]	.....	(1½)	.....	(1½)	.....	(5)	.....	.....	.....
14. Hydroelectricity in million tons coal equivalent	U.N., *Yearbook* (1958)[a]	(5)	(21½)	(3)	(49)	.....	(1)	.....	(41)	.....
15. Total industry (provisional) (rows 10, 11, 12, 13, and 14)	.....	(55)	(41)	(89)	(119½)	(75)	(8½)	(52½)	(66)	(92)
16. Additional factor for directed economy	.....	.....	.....	(89)	.....	(75)	.....	.....	.....	.....
17. Indexes of surplus or deficit: steel	Estimated	.....	(−2)	.....	(−6)	.....	(−1)	.....	.....	(+9)
18. Indexes of surplus or deficit: oil	Estimated	(−5½)	(−4)	(−18)	(−12)	(−15)	.....	(−5)	(−6½)	(−9)
19. Indexes of surplus or deficit: minerals	Estimated	(+11)	(+4)	(−9)	(−12)	(−15)	(−1)	(+5)	(+6½)	(−9)
20. Indexes of surplus or deficit: engineering	Estimated	.....	(−2)	.....	.....	(−7)	(−1)	(−5)	(+6½)	.....
21. Total surplus or deficit factor (rows 17–20)	.....	(+5½)	(−4)	(−27)	(−30)	(−37)	(−3)	(−5)	(+6½)	(−9)
22. Revised industrial total (rows 15, 16, and 21)	.....	*60½*	*37*	*151*	*89½*	*113*	*5½*	*47½*	*72½*	*83*
23. Military personnel (millions)	*Statesman's Yearbook* (1959)	*0.05*	*0.25*	*0.2*	*0.1*	*0.2*	*0.15*	*0.05**	*0.05*	*0.1*
24. Total civil factors (rows 3, 9, and 22)	.....	(216½)	(201)	(194)	(191½)	(172)	(126)	(122)	(115½)	(111)
25. Additional factor for nuclear weapons	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
26. Grand total (rows 3, 9, 22, 23, and 25)	.....	*217*	*203½*	*196*	*192½*	*174*	*127½*	*122½*	*116*	*112*
RANKING	.....	11	12	13	14	15	16	17	18	19

See Explanatory Notes to Table 1 on following page.

EXPLANATORY NOTES TO TABLE 1

1. The area in thousands of square kilometers is divided by 5 if the population density exceeds 201 per square kilometer, by 10 if the density is between 30 and 200 per square kilometer, and by 20 if below 30 per square kilometer. The resulting figure (row 2) is not changed if each kilometer of rail net serves 30 sq. km. or less of the national area; it is reduced by one-third if the service is between 31 and 75 sq. km. per kilometer; by one-half if between 76 and 150 sq. km. per kilometer. If the ratio is over 150 sq. km. for ever kilometer of railroad, row 2 is reduced by two-thirds. The resulting figure (row 3) represents the effective contribution of area to national strength.

2. Row 4 represents the national work force in millions. Some totals (*) have been estimated, since, for China and the U.S.S.R., statistics are not available; others (†) are derived from the *Statesman's Yearbook* (1959), where these are clearly more recent and significantly in excess of the older data in the United Nations *Statistical Yearbook* (1957), much of the material for which is derived from censuses of the early 1950's. In cases where the *Statesman's Yearbook* figures are deficient or not comparable (some omit employers, etc.), the United Nations figures are employed (‡) with a suitable correction based on total population increase since the date of the United Nations figures. Errors are likely to be below 5 points either way in the ultimate reckoning (i.e., even after further calculations).

3. Row 5 represents the above total (row 4) multiplied by 1 if the national consumption of energy is less than 0.5 ton of coal equivalent per head per year; by 2 if between 0.5 and 1.5 tons; by 3 between 1.5 and 3.0 tons; by 4 between 3.0 and 5.0 tons; and by 5 if above 5.0 tons. Row 6 represents the national work force engaged in manufacturing industry (in millions) multiplied five times. Its derivation is similar to that of row 4. Row 7 shows for some nations an increase of one-third or one-half of the figure in row 4, to represent "morale." This is a highly subjective factor, but few will question the intense application of the German and Japanese worker, for example, or the relative purposefulness of workers in many highly developed states, capitalist or Communist. Row 8 indicates the compensation allowed on total population (not shown here) for food deficits or surpluses. The figure is based entirely on the United Nations *Yearbook* tables showing proportion of home-produced supply of wheat, rye, rice, "other grains," and potatoes. Owing to the elasticity of human stomachs, food supplies tend to equal consumption, but deficit countries occur in Europe and Asia, surpluses in Australia and the Americas. Row 4 is a basis for calculation and is not itself added. Rows 5, 6, 7, and 8 together comprise the total population sector—row 9.

4. Rows 10–14 inclusive are relatively straightforward and together form row 15, a provisional total for industrial power. Row 14 has been derived from hydroelectric production in millions of kilowatt-hours by assuming the calorific value of coal to be 10,000 Btu. per pound, and consequently 1 million tons of coal representing 656 million kw-h. Row 15 is added again (row 16) for highly centralized (Communist) economies. Rows 17–20 inclusive represent arbitrary additions or subtractions of 5 or 10 per cent of rows 15 and 16 to account for unduly rich or poor resources. There is no single source for such information; that shown here has been derived from inspection of production and consumption figures, trade balances, and economic atlases. Iron ore is the principal mineral taken into consideration. Row 21 shows the sum total of these surpluses or deficits. Taken together with rows 15 and 16, it shows the revised total industrial contribution.

5. Row 23 shows total military personnel in hundred thousands; row 24 represents the sum total for civil factors. Rows 23 and 24 together give the grand total, except for three countries, for which this total is added again (row 25) to take the possession of nuclear weapons into consideration. In all cases, row 26 represents the completed evaluation of power on the basis of the writer's terms. It consists of the gross totals of rows 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 23, and 25. This addition can be abbreviated to rows 3, 9, 22, 23, and 25. For clarity, these figures are italicized; other figures are in parentheses to show that they form part of the running calculation.

Table 1 may now be read as follows (e.g., for Japan):

The basic area in thousands of square kilometers is 370, to the nearest whole number; a high population density (246 per square kilometer) and good communications (28,000 km. of track, or about 1 km. to every 13 sq. km. of area) give a total area contribution of 74. The work force, here taken as 43½ (millions) is doubled, as Japan uses 1.08 tons of coal equivalent per head (1956 figures). The industrial labor force is about 8 (millions); this gives a corrected total of 40½. A full half of the original work force is added again (22) to indicate the diligence of the Japanese worker. But since Japan can feed only a little over 80 per cent of her total population (1954–56 average), the appropriate proportion (14) is subtracted. Steel production and fuel of all kinds, suitably weighted, total 265. But Japan is reckoned to have a 5 per cent deficit on steel supplies (chiefly imported scrap, since even poorly endowed countries like Japan tend to build steel industries almost up to needs on the basis of scrap). On minerals (chiefly iron ore) and oil, the maximum deficit, 10 per cent, is awarded. This reduces the effective contribution of Japanese industry by 66—to 199. Japanese military power in hundred thousands currently amounts to about 2. The area, population, and industry figures taken together amount to 408½. In the absence of nuclear weapons, Japanese total over-all strength is reckoned on this basis at 410½. Its derivation, strengths, and weaknesses are readily apparent from reference back to unit totals.

Geography and international politics in an era of revolutionary change[1]

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The earth is the stage upon which mankind enacts the drama of life. From time immemorial men have speculated regarding the relations of this earthly stage to human undertakings and accomplishments. Almost every aspect of human affairs has been linked to the distribution and arrangement of things upon and close to the surface of the earth.

Students of that aspect of human affairs which we call "international politics" have long regarded the physical earth as a basic datum of their subject. Every nation-state has a territorial base, a spatial section of the earth's surface in the idiom of geographic science. Territory is one of the absolute requisites of statehood. In nearly all international transactions involving some element of opposition, resistance, struggle, or conflict, the factors of location, space, and distance between the interacting parties have been significant variables. This significance is embodied in the maxim, "Power is local." That is to say, political demands are projected through space from one location to another upon the earth's surface. Such operations involve expenditure of energy and consumption of other resources. A state's access to resources may decisively affect its ability to impose its demands on other nations and, conversely, to resist demands, pressures, and attacks made on it. In ways both obvious and obscure, the factors of climate—air temperature, relative humidity, air circulation, barometric pressure, etc.—also appear to have directly and indirectly affected the distribution of political capabilities over the earth. Awareness of these various non-human factors, and notions as to their limiting effects, have commonly entered into the deliberations of national statesmen and appear on many occasions to have affected significantly the substance of policy decisions.

Today the relations between man and his non-human environment are decidedly in flux. As a result of revolutionary advances in technology and other social changes no less revolutionary, such relationships are probably more unstable than in any previous historical period. There are indications, moreover, that recent huge strides toward the conquest of nature may be altering in fundamental ways the patterns of human existence upon our planet. The function of this discussion is to examine certain aspects of this possibility. The discussion is limited to the phenomena commonly called "international relations" and, more precisely, "in-

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ternational politics." And we shall deal chiefly with the changing international significance of non-human factors of environment, with geographical configuration in particular, and to a lesser degree with distributions of economic resources and climate.[2]

Terms and Concepts

Throughout this discussion we shall be using certain terms and concepts which should be explicitly defined at the outset. *International politics* is one of these. By international politics we mean *only* those transactions and relations between or among nation-states in which some element of opposition, resistance, struggle, or conflict is involved.

Next, the terms *fact* and *factor*. Turning to the dictionary, one finds a fact defined as "something declared to have happened, or to have existed." A fact becomes a factor when it is identified as one of the components or elements of an aggregate which may contribute to an explanation or prediction of an event or state of affairs.

Third, the term *environment*. For the purposes of this discussion it will suffice to define "environment" simply as all phenomena in space and time which are external to the unit under consideration and to which that unit's activities or status may be significantly related. In the study of human affairs the ultimate environed unit is always an individual person. But, by a sort of analogical extension, the concept is loosely used with reference to human groups, including the nation-state. As defined above, the environment of an individual or group includes social, or human, as well as non-human factors. These non-human factors, it should be noted, represent only a fraction of the phenomena generally regarded by geographers as comprising the data of their science or discipline. For the more limited concept of non-human environment, geographers also use the terms *physical environment* and *natural environment*.

Finally, the terms *constants* and *variables*. Empirical phenomena may vary in space or through time, or both. Given the two dimensions—space and time—there are obviously four possible combinations: (1) phenomena constant both in space and through time; (2) phenomena constant in space but variable through time; (3) phenomena variable in space but constant through time; and (4) phenomena variable both in space and through time.

It may be doubted whether any phenomena are distributed absolutely evenly in space. Even such an apparent constant as the oxygen content of the air varies with altitude. With reference to the interactions and political relations of states, the variations of geographical phenomena in space are nearly always significant. This proposition is part of the basis of the geographer's well-recognized interest in this aspect of human affairs. It is likewise the basis of the political analyst's dependence upon geographic science for concepts, theories, and data regarding the distribution and arrangement of phenomena upon the earth.

It is probable that no empirical phenomena are absolutely constant through time. But there may be no significant variation through the time span involved in a particular transaction or sequence of events. Whether factors variable in space are also significantly variable through time depends both on the problem in hand and on the magnitude or the rate of change, or both, during the time span under consideration. Suppose, for example, the problem is to

[2] Elsewhere in this issue of the *Journal*, Captain Charles Konigsberg, U.S.A.F., re-examines some of the voluminous literature on climate and human behavior.

compare the relative abilities of the Soviet Union and the United States to supply agricultural tractors to India during the next six months. In this problem variations in space (factory capacities, raw materials on hand, etc.) are manifestly significant. On the other hand, variation of the spatial variables through time will probably turn out to be quite inconsequential. If, however, the time span is lengthened—say, to five years, in the problem stated—many factors treated as time constants in the short term may become significantly variable both in space and through time in the longer term.

The fourth category (factors variable in space and through time) is by far the most important in the context of international politics, especially for those who are concerned less with day-to-day statecraft than with larger patterns and longer-term trends. Most of the social factors of environment—population, technology, weapons systems, economic development, attitudes and values, institutions, and many others—are changing significantly through time and at different rates in different countries and regions. This fact of differential change is probably the most significant aspect of the social environment in which international statecraft is carried on in our time.

Geographical configurations—the layouts of lands and seas—always exhibit variations in space. But, with certain exceptions, these are among the more stable factors of environment through time spans generally of interest to the political analyst. However, as we shall explain more fully in a moment, even the most stable geographical configurations may be indirectly affected by changes in the social factors.

The distribution of useful materials—water, soil, minerals, etc.—highly variable in space, tends in our age to be differentially variable among countries and regions even through relatively short time spans. Climate, too, varies in space and through time. Both climate and natural resources are subject, like geographical configurations, to changes in significance as the result of changes in the social factors of environment.

Factors and Relationships

Environmental factors, whether constant or variable, can affect human affairs in only two ways. Such factors can be perceived, interpreted, and taken into account by the human actors under consideration. In this way, and in this way only, can environmental factors "influence" attitudes and decisions. The relation of environmental factors to performance and accomplishment (i.e., their relation to the operational consequences of decisions) is quite different. Such factors comprise a sort of matrix, figuratively speaking, which limits the execution of decisions. Limitations on performance and accomplishment are not necessarily dependent on the actor's perception. *Such limitations may be operative irrespective of whether or how the limiting factors are perceived in the process of reaching decisions.*

As we have emphasized on previous occasions, what matters in the explanation of decisions and policies is how the actor *imagined* his environment to be, not how it actually was, whereas what matters in the explanation of accomplishments is how the environment actually was, not how the actor imagined it to be. By suitable change of tense and substitution of assumptions (where necessary) regarding the future state of the environment, the same two propositions differentiate the prediction of policy decisions from the estimation of capabilities. Consistent observance of this simple distinction—between the relation of environmental factors to attitudes and decisions, on the one hand, and to accomplishments and capabilities, on the other—would help to avoid the confused and footless dis-

putation which has characterized so much of the discussion of man-environment relationships (12, 13).

The earth as a concept in men's minds.—An important corollary flows from the first of the two propositions just above. It is that, with reference to attitudes and decisions, *erroneous* geographical conceptions may be just as "influential" as notions that do correspond to the "facts" of the "real world."

Any number of examples could be cited to illustrate this proposition. The queen of Spain financed Columbus to sail westward across the Atlantic to "discover" Asia, in ignorance of the geographic facts that rendered the undertaking impossible to carry out as planned. After Columbus returned, the pope drew a line dividing the oceanic realm between Spain and Portugal in a manner that indicated a similar misconception of geographic realities. For centuries men imagined that the Atlantic and Indian oceans were separate and unconnected bodies of water. In a recent book entitled *The Southeast in Early Maps* (5), a sequence of maps drawn through a period of several centuries shows how slow and halting has been the accumulation of reasonably accurate geographical knowledge. The United States–Canadian boundary was originally drawn in ignorance of the actual geographic layout. How many oil wells have been driven where no oil existed? How many farmers have attempted to grow crops unsuited to the particular soil and climate? How many military campaigns have failed because of erroneous notions of the topographic, climatic, or other physical obstacles to be overcome?

Frequently important misconceptions arise not from ignorance of the layouts themselves but from ignorance or neglect of their political significance. The great British naval base upon the island of Singapore was designed on the mistaken assumption that swamps, jungles, and other natural obstacles would prevent any hostile approach across the nearby mainland of Malaya. Englishmen still speak of "going to Europe" when they ferry or fly the twenty to sixty miles across the Channel. Many Americans still behave as if the wide oceans protected their country as in the early days of the Republic, even though scores of planes traverse these oceans daily in a few hours, and every American city lies within range of Russian ballistic missiles.

Discrepancies between the earth as it is and as men have imagined it to be are characteristic of all peoples. In a passage of great eloquence and insight, the great British geographer Sir Halford Mackinder observed:

> The influence of geographical conditions upon human activities has depended . . . not merely on the realities as we now know them to be and to have been, but in even greater degree on what men imagined in regard to them. . . . Each century has had its own geographical perspective. . . . To this day . . . our view of the geographical realities is colored for practical purposes by our preconceptions from the past. In other words, human society is still related to the facts of geography not as they are, but in no small measure as they have been approached in the course of history [9, pp. 28–30].

These words, written over forty years ago in the final days of World War I, have a continuing relevance today as we struggle to readjust our geographical ideas to the realities of the nuclear age.

The impact of maps.—One can scarcely hope to understand the foreign policies and interactions of states without the aid of maps; and yet maps have long been one of the more prolific sources of confused thinking about international politics.

To date no human eyes have ever directly observed any large area of the earth's surface from a single viewing point. The day is evidently approaching when cameras

in man-made satellites may photograph an entire continent or more at once. But that is not the way our present knowledge of the earth's surface has been derived. Such knowledge has been accumulated bit by bit, from impressionistic accounts of explorers, navigators, and other travelers, supplemented in more recent times by measurements taken with compass, sextant, chronometer, transit, barometer, and other instruments.

In our own century, aircraft equipped with cameras have added details and some precision to our knowledge of the layout of lands and seas and the surface configuration of the land. More is likewise known about the location and magnitude of mineral bodies and about the distribution of climatic phenomena. But the process to date still remains one of fitting together bits and pieces of information and, with these data, of constructing models of the earth's surface, subsurface, and atmosphere.

Such models, as is well known, are of two kinds: globes and flat maps. Globes come closer to being replicas of the earth. But even the largest globes require gross oversimplification. Because of their lower cost and bulk, moreover, people have come to rely mainly upon flat maps for their visual concepts of the layouts of our human habitat.

Maps, like all models, are indispensable but tricky tools. Used with knowledge of their properties and limitations, maps can illuminate almost every international problem. Without them the statesman, the military strategist, the teacher, his students, and everyone else would be as helpless as a navigator without chart and compass. (Nevertheless, we are convinced that a survey of our schools, colleges, and universities would reveal the shocking state of affairs that a relatively small minority of teachers make any continuous and imaginative use of maps in their classes and lectures.)

A map to be effective, and not misleading, must fit the job in hand or, at least, be used with explicit awareness of its properties and limitations. This is elementary common sense to any geographer. It is evidently not so obvious to many teachers of international subjects, to college and university administrations, and to the editors of books, magazines, and newspapers. Undiscriminating use of "any old map" (if indeed any map at all is used) has been and continues to be a common source of geographical misconceptions. These in turn appear to have been responsible—at least in some degree—for many illusions regarding the political relations of nations.

Experts disagree sometimes as to what map projection is best suited to a given problem. But there is no disagreement that the still ubiquitous Mercator world map, which depicts the earth's surface as a rectangle, has profoundly affected people's thinking about international politics. The continents can be centered in various ways on the Mercator map, or the map can be continued horizontally so as to show certain areas more than once. Frequently in American versions of the Mercator map, the United States appears in the center, with the divided halves of Eurasia at the right and left margins. Looking at such a map encourages the illusion that the United States does in fact occupy the strategic central position. If, however, the map is shifted so that the Soviet Union appears in the middle, with a divided America on the margins, precisely the opposite geopolitical illusion is evoked! The fact of the matter is, of course, that neither the Soviet Union nor the United States nor any other country occupies a central position upon the terrestrial globe. The strategic properties of their respective geographical positions depend on

the state of technology, the patterns of international political relations, and the kinds of contingencies envisaged.

Meridians of longitude, those imaginary lines which converge to a point at each pole, appear as vertical parallel lines on the Mercator grid. Parallels of latitude are parallel as on the globe. But, as a result of the mode of projection from sphere to plane, degrees of latitude are progressively exaggerated from the equator to the poles. Thus both east-west and north-south distances appear increasingly too long the farther one moves from the equator. Each pole is transformed from a point, as it is on the globe, to a line the same length as the equator.

These features make the Mercator map conformal; that is, shapes are not seriously distorted. But conformality is purchased at the price of gross distortion of areas as well as distances, especially in the higher latitudes. Greenland, as every geographer and some non-geographers too are aware, *appears* about the same size as South America, but is in fact only about one-tenth as large. Canada, Alaska, the British Isles, northern Europe, and the Soviet Union all appear relatively larger than they are in reality.

The Mercator map was designed as a chart for mariners. Since meridians and parallels on this grid intersect at right angles, as they do on the globe, it follows that a straight line connecting any two points on the map shows the same compass bearing at every point on the line. But such lines, with certain minor exceptions, do not represent the shortest distance between the points. Most "great circles" appear as curved lines on the Mercator map.

As a chart for navigating ships across the ocean, the Mercator map was nearly ideal. As long as European states dominated the world, and ships provided the only links connecting continents, the Mercator map was also fairly satisfactory for depicting commercial and military phenomena. A Mercator map, placed with its central north-south axis on the longitude of London, illustrated quite well the geographic structure of British sea power in the nineteenth century.

As a map to illuminate the intercontinental relations of the Soviet Union and the United States, in an age of jet planes and ballistic missiles, the Mercator map (however centered) has serious and manifest defects. No Mercator map can depict the clustering of Canada and the Soviet Union around the Arctic Ocean. Viewed upon this map, the elaborate system of American air defenses in northern Canada and Greenland makes no sense whatever. Likewise the Mercator map exaggerates the width of the northern reaches of the Atlantic and Pacific oceans, thereby contributing to the historic American illusion of political and military isolation from the Old World.

The impact of the traditionally ubiquitous Mercator map on political thinking is easily exemplified. At the end of the last century it was widely believed essential for the United States to acquire a naval port in the Samoan Islands. The reason most commonly given was the need for a naval outpost on the western approach to the projected Panama Canal. Even on the Mercator map, the distance from Samoa to Panama looks rather long. But, on a globe, the project is shown to have been roughly equivalent to acquiring a naval port in the Baltic Sea for defense of the port of New York.

Hawaii and Guam, annexed in 1898, were visualized then and later as naval "stepping stones" on the "direct route" to the Philippine Islands. And so they do appear on the Mercator map. But the shortest route to Asia, by steamship as well as by plane, lies approximately 2,000 miles to the north of these mid-Pacific islands.

The most extreme example of the spell cast by Mercator's world map comes from the autobiography of George Frisbie Hoar, senator from Massachusetts around the turn of the century. Senator Hoar supported annexation of Hawaii—why? Let him tell in his own words! "Hawaii is 2,100 miles from our Pacific coast. Yet if a line be drawn from the point of our territory nearest Asia to the southern boundary of California, that line being the chord of which our Pacific coast is the bow, Hawaii will fall this side of it" (7, p. 305). We suggest that the reader try this one upon a Mercator map and check his result on a globe. We think he will agree that Hoar out-Mercatored Mercator!

Much more could be said, if space permitted, regarding the properties of maps and their impact on our thinking about international relations in the nuclear age. The conclusion that we want to emphasize is simply that people's attitudes and also the decisions of statesmen are based upon their conceptions of geographical realities, and these in turn appear to depend considerably upon the kinds of maps to which they are accustomed.

Important as it is to imagine how men have imagined the earth to be, and how they have reacted to these images, that is only half the picture. The earth is not merely a concept in men's minds. It is also a pervasive reality which sets limits to human performance and accomplishment—limits which are operative regardless of whether or how perceived by the actors upon the earthly stage.

The "fact" of such limitations has been generally taken for granted. Which sets of limitations have had, or may have, the most significant impacts on history is an issue on which historians, geographers, and others are sharply divided. In the sphere of international politics, hypotheses which purport to explain past distributions of power and influence, or to predict future distribuitons, by reference to particular sets of geographical factors, have come in our century to be rather generally designated "geopolitics" or, more precisely, "geopolitical hypotheses."

Geopolitical Hypotheses

Certain general considerations apply to all geopolitical theorizing and speculation. Geopolitical hypotheses may serve various purposes. The purpose may be simply to explain the distribution of political power and influence over the earth at different historical periods or to predict possible or probable future distributions. Or the purpose may be to discover what alterations of a given status quo are possible to achieve with the opportunities and means available or to estimate what would have to be done in order to bring about a desired change. Or the purpose may be to influence policy-makers and their constituents in favor of some specific course of action. Geopolitical hypotheses, in short, may serve the purposes either of contemplative research or of policy-making and propaganda.

Most geopolitical writings, whatever the avowed intent of their authors, have tended to serve both kinds of purposes. More often than not, one can detect some mixture of pure analysis *and* propaganda. That is to say, most geopolitical writings, even those which purport to be "scientific" and politically neutral, are found to embody some element of argument justifying or attacking a particular state of affairs or proposing ways to change it.

All geopolitical discussion, furthermore, is carried on with reference to some set of percepts or assumptions regarding the state of the environment. The theorizer starts with a set of ideas about the layout of things in space and their movements and changes through time. He makes assump-

tions, or reaches conclusions on the basis of evidence, as to which factors of the environment are most significant and which are undergoing or likely to undergo significant change during the time span under consideration.

The fruitfulness of geopolitical theorizing may depend on these initial assumptions. Yet those who make use of such hypotheses for research, teaching, propaganda, or policy-making often overlook or disregard the assumptions built into them. This fosters either fruitless disputation or uncritical acceptance of geopolitical propositions after events may have falsified some or all of their underlying premises.

Broadly speaking, the more important geopolitical hypotheses sort into the three categories of non-human factors, cited early in this discussion:

1. Hypotheses in which the distribution of political power and influence in the society of nations are explained or predicted mainly (though not necessarily exclusively) as a function of *geographical configurations*, especially the global layout of continents, oceans, and connecting seas. Important representatives of this type of geopolitical theory were Mahan, Mackinder, and Spykman.

2. Hypotheses in which political distributions are explained or predicted mainly as a function of variations of *climate* in space and through time. Ellsworth Huntington has been the most famous representative of this category, though there are a great many lesser figures too.

3. Hypotheses in which political distributions are explained or predicted mainly as a function of variations among nations in security of *access* to useful earth materials, especially non-human sources of energy. Professor Emeritus Taylor Thom of the Department of Geology at Princeton has been one of the leading exponents of this type of theory.

All the more important geopolitical hypotheses have evoked controversy. Much of this controversy has been disputatious and not especially rewarding, but geopolitical speculation and theorizing has enriched our understanding of the international system and of past and present trends in the relations of states. The principal targets of controversy—which includes all of those cited above—were neither knaves nor lunatics but serious, competent, and astute observers of the international scene.

Probably no generalization from a limited number of variables will ever explain everything satisfactorily. But any of the geopolitical hypotheses cited above, and a good many more as well, provide a fruitful starting point, a sort of first approximation to be qualified and modified by taking into account additional factors as may seem necessary from the critic's own perspective in space and time.

Most geopolitical hypotheses become outdated in time by the march of events. Perhaps the most serious defect in geopolitical theorizing has been the almost universal failure of the theorists to anticipate and allow for the rate of technological and other change. Mahan, for example, beheld the early development of aircraft (Mahan died in 1914), yet there is no indication in his writings that he anticipated in the slightest the impending impact of air power on naval tactics and world political patterns. Mackinder (8, 9) sensed rather more clearly the accelerating advance of technology, but he persisted to his dying day in the attempt to fit these and other changes into an increasingly obsolescent frame of reference in which the most strategic variables were location, space, distance, and geographical configurations.

Implications of Environmental Change

At any given time and place there is usually some range of fruitful choice with reference to a given sphere of human interest and activity. There may be choice among ends and choice among alternative means to desired ends. The range of fruitful choice is constantly changing. In some historical periods it changes slowly; in others, more rapidly, depending upon the nature and rate of changes among the non-human and social components of the environment. We are living through a period in which change is rapid and far-reaching and in which the political implications of change are probably more revolutionary than is generally appreciated.

With reference to the non-human environment, change presents two facets: changes in the non-human factors themselves, and changes in social factors which in turn alter the political properties or meaning of relatively stable non-human factors. Let us consider first the changes that take place in the non-human factors themselves.

Some of these changes, we may note in passing, arise from physical processes of nature: earth slipping, volcanoes erupting, rocks falling, water flowing and freezing, wind blowing, plants, animals, and microorganisms reproducing, multiplying, or dying out, etc. Sometimes these "natural" processes produce human catastrophes such as earthquakes, floods, famines, and epidemics; occasionally, such catastrophes have affected in some degree the patterns of international politics.

Alongside these natural phenomena—and probably more important in the context of international politics—are changes in the earth wrought by the hand of man. Let us examine some of these briefly. With advancing technology—that is, with more effective tools and skills—men have increasingly changed the physical structure of the earth itself. They have dug canals and changed the course of rivers. They have built harbors and tunneled through mountains. They have cut down forests and planted new ones. They have depleted the soil and sometimes restored its fertility. They have made deserts bloom and have turned verdant landscapes into deserts. They have pumped irreplaceable oil and natural gas from underground reservoirs. They have consumed underground water faster than it could accumulate. They have smashed atoms and fused them. They have created new elements and transmuted matter into energy. In these and many other ways, men have altered at ever accelerating rate the structure of their earthly habitat.

Such structural changes have affected in greater or lesser degree the economic and military capabilities of nations and their political relations in peace and in war. A good historical example is the opening of the Suez Canal in 1869. That engineering feat cleared a shipway across the desert which had separated the Mediterranean Sea from the Indian Ocean. The canal cut several thousand miles from voyages between European ports and the ports of southern and eastern Asia. It soon became one of the most heavily used trunk lines of *international* commerce. But the canal also became the strategic axis of the *internal* communications system of the British Empire. This led within a few years to British occupation of Egypt and British military domination of the canal. Thus it is probably no exaggeration to conclude that the opening of the Suez Canal altered the strategic geography of the British Empire and affected Britain's political relations with nearly every state and region.

As another example, consider the international implications of the heavy and pro-

gressive depletion of North American forests, soils, mineral fuels, ores, and other natural resources. This depletion has been going on for well over a century. The rate of depletion has turned sharply upward in recent decades. Consumption of natural resources reached record levels during World War II. It is climbing to still higher peaks in our time. These alterations of the physical geography of North America have various political implications. Not the least of these is the increasing dependence of the United States on imported iron ore and other basic raw materials in a period of continuing change in the international political relations of all states and regions.

The international consequences of man-made changes in the earth's surface and subsurface have been great in the past and seem likely to be even greater in the future. But, great as these changes have been, they are overshadowed and probably outweighed in their political effects by other changes—especially advances in science and engineering—which, while not actually altering the basic structure of the earth's surface substantially, have given new meanings and values to such geographic features as location, distance, terrain, climate, and natural resources.

Consider, for example, the changes which have taken place in the military properties of oceanic space during the last sixty or seventy years. Theories of sea power which appeared, in 1900, to be as permanent as the oceans themselves have become progressively obsolescent during the intervening years. Yet the oceans and connecting seas (one set of environmental factors) have remained approximately constant in terms of this particular development. Their size and shape have not changed significantly. But the activities which men can carry out upon the oceans and connecting seas have changed profoundly. Ships now have power plants designed to cruise greater distances without refueling. Methods for refueling at sea have been perfected for naval vessels. Submarines with automotive torpedoes have become formidable instrumentalities with which to challenge the passage of vessels upon the surface. Special ships have been designed for landing troops and heavy equipment on hostile open beaches. Aircraft have become powerful factors in the control of the sea and of lands beyond the seas. Submarines propelled by nuclear engines can remain beneath the surface for months at a time. Rockets with nuclear warheads can be launched from beneath the water's surface. These and many other technological advances have radically modified and continue to modify the military properties of oceanic space.

It would be difficult to exaggerate the importance of the giant and ever lengthening strides with which modern science and engineering are conquering space. Man has speeded up and enormously increased the capacity of transport and communications. He has created more and ever more deadly weapons systems with which to threaten, if not actually to destroy, his fellow men and all their works. He has made astounding advances in medicine, sanitation, weather forecasting, climatic adaptation, agriculture, metallurgy, and other branches of engineering and technology.

These achievements affect in many ways the range of fruitful choices open to the statesmen. Sometimes the effect has been narrowing; more often it has been broadening. In order to understand and appreciate the impact of these developments, the political properties and meanings of geographic facts have to be reconsidered in the light of technological and other social changes. If attention is directed to one set of environmental factors—oceanic space, in the example above—the change in the range of pos-

sible performance and accomplishment appears as an adaptation to a stable environment. But such adaptation appears, from a different perspective, to consist of alterations in another set of environmental factors—modes of transportation and design of weapons, in the example—alterations which change the social meaning, or properties, or implications of environmental factors which themselves may not have undergone significant structural change.

This interaction between human activities and the non-human environment has been going on ever since man emerged as a tool-inventing and tool-using creature. But, until a century or so ago, the rate of technological change was slow. Today the rate is rapid and seems to be still accelerating. The unsettling effects of new tools and new techniques on the political, military, and economic meaning of geographic layouts and configurations, climatic variations, and the distributions of useful earth materials have great and varied significance for the student of international politics.

It is out of the question, within the limited compass of this discussion, to undertake any comprehensive inventory of these effects. The most that we can do in the remaining pages is to raise a few issues and suggest some hypotheses both tentative and controversial.

Changing significance of geographical configuration.—At the close of the lecture to the Royal Geographical Society (8, pp. 421–44), in 1904, in which Mackinder outlined his geopolitical interpretation of history and advanced his hypothesis of the future predominance of the Eurasian "Heartland," one member of his audience rose to challenge the whole conception. This man was Leopold S. Amery, a name virtually unknown to most Americans despite his subsequent long career in the British public service.

Amery contended that a "great deal of this geographical distribution must lose its importance" with future advances in the means of transportation on land, upon the sea, and in the air. "The successful powers" of the future, he predicted, would be "those which have the greatest industrial basis." It would "not matter whether they are in the center of a continent or on an island; those people who have the industrial power and the power of invention and science will be able to defeat all others" (1).

Events of the past half-century have clearly gone some way toward confirming Amery's prediction. Naval forces can now refuel and carry out even major repairs at sea. This has reduced the military value of permanent oversea bases. Submarines, bombing planes, and ballistic missiles have eroded the former defensive strength of islands, peninsulas, promontories, and remote ports on coasts protected by mountains, deserts, or jungles. Airplanes have "shrunk" the widest oceans and continents and have surmounted refractory barriers of terrain and distance. Pipe lines, motor vehicles, and still expanding railway and highway grids have enormously increased the mobility of overland transport. These and other changes in weapons and transport have profoundly altered the relative political and military values of heartlands, marginal lands, and islands.

The physical layout of lands and seas, as emphasized above, has not changed substantially. The deserts, mountains, and prairies, the configuration of coast lines, and other physical dimensions of our planet remain substantially unchanged. What has changed, and changed radically, is the political and military value of these geographic facts—changes resulting in large measure from the revolutionary advances of modern engineering and technology.

Changing character of environmental lim-

itations.—Americans, Russians, and others display understandable pride in the part which their respective nationalities have played, and are playing, in the massive twentieth-century assault on the non-human environment. From pride in achievement it is only a step to imagining that the world is "our oyster." Yet as the late Isaiah Bowman pungently observed, over twenty-five years ago, "For all his independence and ingenuity [man] can never wholly escape from his environment. He cannot move mountains without floating a bond issue. . . . Man conforms to many defective layouts because it would cost him too much to alter them" (2, pp. 3–4).

What Bowman seems to be suggesting—and it is even more true today than in the 1930's–is that the problem of overcoming the limitations of the non-human environment has become more economic than purely technological. In the technically advanced countries at least, sufficient engineering knowledge is available to accomplish a great deal more than is actually undertaken. More railroads and highways could be built and more airlines established. More ores could be mined and refined, and more synthetic substitutes for scarce natural resources could be produced. More people could be more adequately fed. More and better medical service could be provided. More buildings could be cooled in hot, damp climates. More swamps could be drained. Sea water could be desalted and more deserts irrigated. Explorations of outer space could be speeded up. Weapons could be further improved and military establishments generally strengthened. Industries could be relocated to make them less vulnerable to airborne nuclear attacks.

When such projects are contemplated, the issue is rarely one of technical capacity alone. The issues are rather: How much will it cost? What projects should have priority? Who is going to pay for it? Money spent on television sets, new motorcars, expensive vacations, and other ingredients of a high standard of living cannot be spent on fallout shelters, industrial relocation, or other projects designed to strengthen a country's defenses. Tolerance for austerity varies widely from one country to another. Sensitivity of politicians to public demands also varies from one political system to another. That is to say, limitations on public policy that are imposed by the social order have become in general more important—and in some countries very much more important—than limitations imposed by space, adverse climate, or any other set of non-human factors.

This is not to argue that technology has erased differentials in opportunities and limitations among nations. It is certainly true that many more units of energy are required to heat buildings in winter and to keep them tolerably cool in summer in the savage mid-continental climate of the American Middle West than in the milder climates of Britain and France. It is likewise true that greater expenditure of energy is required to haul ores and other heavy freights across the vast continental space of the Soviet Union than is required for similar tasks in a small compact country like Britain.

Every country has "natural" advantages and disadvantages in comparison with any other. Technological advances may narrow these differences, provided certain other conditions prevail. In any case, the consequence of achieving a higher level of productivity per capita is that this enables a people to pay a higher price for overcoming "natural" obstacles which, at a lower economic and technological level, were insurmountable. The more efficient a people's equipment, and the greater their skills, the greater becomes their potential capacity to

master the limitations of the non-human environment—and do so at a price compatible with their conception of a tolerable standard of living.

From this perspective, one queries writings which attribute a certain absoluteness to the limitations set by the non-human environment. An example of this is a little book entitled *How Strong Is Russia?* by George Cressey (4), of Syracuse University. In this book, published in 1954, Cressey seems to us to come very close to arguing that the non-human environment of the Soviet Union presents permanently disabling obstacles to successful Soviet competition with western Europe and the United States. Cressey writes:

> Geography has imposed permanent limitations on the development of the Soviet Union. Man can do much, but the restrictions of great distances, remoteness from the ocean, terrain, short growing seasons, inadequate and variable rainfall, and continentality will always remain. . . . The geographic potentials are very large, but the geographic limitations are formidable. . . . Premier Stalin gave his country the task "to overtake and surpass the capitalist world." From the standpoint of geography this does not appear possible. Limitations of location, climate, scattered resources, and continentality combine to create landscapes which no amount of planning can fully surmount. Whatever its government, Russia can never become a truly great world power [4, pp. 29, 98, 120].

If these quotations accurately summarize Cressey's conclusions, it seems to us us that he has seriously underestimated the implications of rapid technological advance and of differences in national political systems. No one could quarrel with the premise that every nation pays a price for its accomplishments and that the price tag may be higher or lower depending on the country's location, area, configuration, climate, mineral bodies, and other resources. But a deduction, from this premise, that a state with greater "natural" obstacles to overcome cannot allocate more goods and services to the pursuit of political objectives, or play as influential a role as states more favorably endowed by "nature," would appear to be tenable only on one or both of the following assumptions: (1) that the period of rapid technological advance is drawing to a close and (2) that similar values and principles govern the allocation of goods and services in the Soviet Union as in other great states.

Neither of these assumptions is sound, in our judgment. All evidence known to us indicates that further technological breakthroughs are in prospect in such fields as nuclear fuels, climate control, plant breeding, etc. Such advances are likely in the future, as in the past, to diminish the handicaps of distance, area, location, or other non-human factors. Furthermore, governmental policies determining who gets what and how much vary widely from one political system to another. As already emphasized, values and demands vary, tolerance for austerity varies, sensitivity of politicians to public demands varies, ability of politicians to mold public opinion varies, and so do many other features of national political systems. This brings us back to our major conclusion in this section—that one of the consequences of rapid and continuing technological advance is to make limitations imposed by the social order relatively more significant politically than "natural" obstacles present in the non-human environment.

Environmental limitations and social catastrophe.—A rather different sort of environmental limitation on the modern state has been argued by Harrison Brown (3, chap. vii), of the California Institute of Technology. Brown emphasizes that the enormous and still rising consumption of mineral ores and fuels in recent years has depleted most of the more accessible and easily worked sources of non-renewable raw materials. From here on out, it will require

deeper mines and oil wells, and more complicated industrial installations and processes, to reach and utilize the poorer-grade raw materials upon which industrial societies will have increasingly to depend.

Such dependence is all very well, Brown argues, so long as no nuclear war or other social catastrophe destroys the complicated installations and disrupts the increasingly complex and delicate industrial processes and interrelations. But he advances the profoundly disturbing thesis that, once destroyed, our fragile industrial civilization could never make a successful fresh start with the low-grade ores and more inaccessible fuels which would remain available.

This thesis is manifestly controversial. But it rests upon solid facts and should be carefully examined. Above all, its international political implications should be explored. If Brown's thesis is accepted, the conclusion follows that our conquest of nature, of which twentieth-century man is so proud and boastful, is viable only in a universe from which total war fought with nuclear weapons is permanently excluded. A further implication latent in Brown's thesis is that nuclear war would probably disable countries in proportion roughly to their level of industrialization and to the geographical concentration of their industrial conurbations. In plain English, a reasonable inference from Brown's thesis is that a future general war would wipe out the densely inhabited industrial countries of western Europe, damage the United States and Soviet Union probably beyond recovery, and turn over the management of the earth to the Chinese Communsits and other emerging nations of Asia and Africa.

Modern arms and the territorial state.—We come finally to the most controversial hypothesis of all. This hypothesis, put forward by John Herz (6), of City College, New York, holds that modern weapons systems are inexorably eroding the foundations of the territorial state itself. The point at issue is whether the territorial state, which for several centuries has been the basic unit of the international system, can much longer perform the supreme function for which it evolved—the function of providing a reasonable degree of safety for the person and property of its members.

Various hypotheses have been advanced to explain the integration of medieval towns and feudal communities into larger political-territorial units. At least one of the necessary conditions for this development seems to have been the "gunpowder revolution." The invention and improvement of firearms made castles and walled towns increasingly less defensible, that is to say, more easily penetrable by force. The same development, combined with some improvement in roads and haulage, made it possible to mobilize larger forces to defend larger geographical areas. More efficient weapons and communications likewise enlarged the geographical area which could be effectively policed and administered from a single capital. Thus the large-area state, in the words of Herz, "came finally to occupy the place that the castle or fortified town had previously held as a unit of impenetrability."

In the centuries that followed the formation of modern territorial nation-states, the prime function of statecraft was to make and to keep the country's geographical boundaries as impenetrable as possible. In pursuit of this objective—the direct antecedent of today's expanded concept of national security—much attention was given to achieving strong "natural boundaries." Among the coveted kinds of natural boundaries seacoasts ranked high, and a state that was wholly insular came to be regarded as fortunate indeed. Other forms of strong natural boundaries included rivers, moun-

tains and other rough terrain, deserts, and jungles. Economic goods and services were poured into frontier fortifications, military roads, and other installations designed to strengthen "weak" and vulnerable boundaries.

Geographical space—between the state's boundaries and its vital centers of population and economic production—was likewise regarded as a strategic asset. Where space was deemed inadequate, a buffer zone of protected states—we would call them "satellites" today—might be created to absorb the shock of invasion. As late as 1918, Sir Halford Mackinder (9) outlined such a project to keep partially defeated Germany and Revolutionary Russia physically apart and to provide a security zone for western Europe. This project envisaged establishing a tier of small states in eastern Europe all the way from the Baltic to the Black Sea. The Peace Conference of 1919 did create such a buffer zone—with results that are well-known history.

By the end of World War I there was considerable evidence that developments in weapons were undermining the security of the territorial state. A long sequence of inventions had greatly increased the per capita firepower of military forces. Railroads, better roads, and motor vehicles had given greater overland mobility to this growing firepower. The development of mines, automotive torpedoes, and submarines provided more effective instruments with which to sink cargo shipping and to blockade marine frontiers. Aircraft, though still primitive, provided more than a hint of the possibility of overleaping even the most strongly fortified frontiers.

Subsequent development of air power transformed the hint into fearsome reality. For the first time in history it has become possible to project terrific firepower over great distances to attack the complex industrial conurbations upon which modern military power depends—and do so without blasting a path across fortified land frontiers or storming ashore on hostile open beaches. In the seesaw struggle between offensive and defensive weapons systems, the offense has decisively outrun the defense. There are rumors of antimissile missiles and other defensive innovations around the corner. Such a development might conceivably restore in some degree the shattered impenetrability of the territorial state. But it is noteworthy that many leading scientists and engineers are pessimistic of achieving any really defective defense against missile-borne nuclear explosives.

In 1957 the British Government candidly recognized this state of affairs. Perhaps the most important sentence in its statement on defense that year was the frank admission that "there is at present no means of providing adequate protection for the people of this country against the consequences of an attack with nuclear weapons" (11).

Some reactions within the United States to this British candor were characteristic of the seeming inability of so many of us Americans to come to terms with the technological revolution in which we are caught. One comment, more or less typical of many others, was that the Western Allies ought to "work and plan hopefully toward an effective defense against hydrogen weapons rather than proclaiming and thus encouraging a sense of hopelessness among the people" (10). Certainly, such efforts will continue. But is it safe to ignore the opposite possibility—which may, indeed, be the more probable of the two—that no really effective defense can be perfected to protect nations against devastating airborne attacks with thermonuclear explosives?

If the latter turns out to be the case, future historians from the perspective of the twenty-first century (if somehow the ulti-

mate catastrophe is avoided and if there are historians left to interpret the past) may well conclude that the combination of thermonuclear explosives, long-range bombing planes, and ballistic missiles made the territorial nation-state as unviable as the medieval castle became after the development of artillery.

These speculations all point to the conclusion that the technological revolution and other social changes taking place in our time are affecting the international political significance of location, distance, space, terrain, climate, and natural resources. Broadly speaking, the geographical layout of lands and seas and the configuration of the lands have lost much of the military-political value once attached to these factors. Insularity has less protective value. Commanding positions, athwart the trunk lines of international commerce—such as Gibraltar, Malta, Suez, and Singapore—no longer provide the leverage they formerly did. Outlying military installations become progressively less tenable, not only in a strictly military sense, but also because of the attitudes and policies of the new nations within whose territory many of them are located. Mountain passes, river valleys, and other "natural pathways" have likewise lost most of their political and military significance. The study of boundaries has changed in the main from analysis of military strength and weakness to analysis of transition zones where one culture merges into another. Attempts to achieve national "self-sufficiency" continue sporadically, but that struggle too is a lost cause, what with the progressive depletion of easily accessible resources and the extended list of materials required at the more advanced levels of economic development.

When all is said, countries and regions still differ, and these differences have political significance. They differ in stage of industrialization and urbanization and, consequently, in degrees of vulnerability to bombardment with nuclear weapons. Differences in economic development mean differences in ability to provide goods and services for military or other political purposes as well as to satisfy general consumer demands. Such differences still depend in some degree upon limitations implicit in the non-human environment; but, increasingly, they depend more on limitations imposed by the technological level and by the structure and operation of the national social order.

Nations still differ in attitudes, aspirations, and expectations as well as in their capacity to translate aspirations into solid accomplishments. Notions of what is desirable and what is possible, what should be supported and what should be resisted, are deeply rooted, as Mackinder emphasized, in each people's geographical and other preconceptions from the past. Time lag between environmental change and general awareness of such change and the consequences thereof is not a new phenomenon. But, because of the nature and rate of technological and other changes taking place today, the gap between image and reality seems to be both wider and more dangerous than in any period since the formation of the modern international system.

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Erratum

In Volume III, Number 4, Robert LeVine's article, "Anti-European Violence in Africa: A Comparative Analysis," was mistakenly placed in the Discussion and Reviews section.

Suggestions to Contributors

An important purpose of *Conflict Resolution* is to stimulate systematic research on international processes. The *Journal* provides a channel of communication for the research and thinking which are already being done, including work directly in this area and work in related areas that is potentially relevant. In addition, the *Journal* enriches the study of international relations by encouraging, within the behavioral sciences, a new area of specialization. Since the *Journal* is concerned with problem area rather than discipline, it provides the interdisciplinary context favorable to research on international behavior.

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